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JUNE 1988
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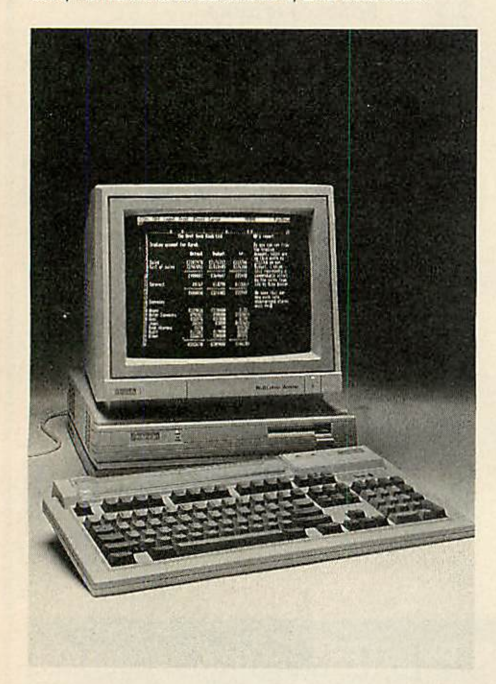
Ac. U. 6/88

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With this new approach you get a whole new dimension of power . . .

PipeDream is a word processor offering many columns of formatted text. That film script you were going to write next holiday? Ideal.

PipeDream is a spreadsheet program with a work area of 500,000,000 columns by over 500,000,000 rows, so you'll grow out of your computer before you grow out of PipeDream.

And being able to mix numbers and text together means you can calculate invoices and mail-shot them without resorting to expensive accounting software.

In fact, PipeDream's unique integration means that mail-shots couldn't be easier.

Simply type in your letter or invoice, leaving gaps for names, addresses and payment dates. Then PipeDream will print the letter to each addressee, automatically inserting all the details, and keeping the text neatly formatted and aligned.

And database and spreadsheet functions can work together.

You can use PipeDream as a database program to maintain your address book or sales ledger. Perform selections and sorts to invoice all of those customers living in London who have bought more than 100 products from you since February but haven't paid within 30 days.

The price of all this power? Just £99+VAT.

But don't just take our word for it. This is what Michael Bywater of *Punch* had to say:

"PipeDream itself is a remarkable achievement. It offers a spreadsheet, a word processor and a database, and if you think I am talking about a conventional integrated program, you are wrong. PipeDream does all those things within one program. No switching between modules or cutting and pasting; PipeDream simply offers you a matrix of 'slots' into which you can either type continuous text or figures or formulae or database 'fields'."

That was PipeDream on the Z88.

Now we've completely rewritten it for Archimedes. The result is even friendlier, faster and more powerful. There are full menus and dialogue boxes, making the most complex operations easy to carry out. You'll probably never even need to look at the comprehensive PipeDream tutorial and reference book. And keyboard wizards will love the optimised keystroke alternatives to the menus. Some will even devise their own key layouts, using PipeDream's unique keyboard programmability.

We've maintained 100% file and keystroke compatibility with Z88 PipeDream, so you can transfer files between the Z88 and your Archimedes.

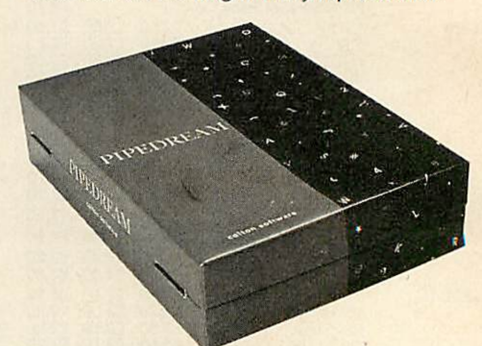
PipeDream is also 100% file compatible with PipeDream on the IBM PC, and Acornsoft's VIEW PROFESSIONAL for the BBC Microcomputer, so you could work at home on your BBC Microcomputer and take your files to the office on your Z88, to use on your Archimedes or IBM PC. No other software enables you to share your files with all these computers.

New facilities include:

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- full usage of foreign characters including direct editing and printing
- loading and saving in several formats giving compatibility with Lotus 1-2-3
- linking files enabling you to pass the results of calculations between spreadsheets.

This in addition to all the facilities many thousands of Z88 PipeDream users have come to expect:

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ACORNUSER

ISSUE No 71 JUNE 1988



COVER FEATURE
Music from drums, MIDI, Music 5000, and hit band Erasure all in this issue – pages 49-69

Photography by Dave King. Roland D50 and PG1000 from Music Lab, London; Ultimate Support from the Synthesiser Centre, London.

Acorn is a very small company. To put them in perspective, Apple's profit last year was more than Acorn's total turnover.

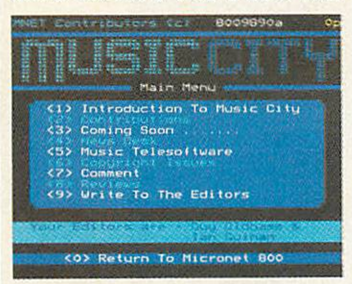
Acorn made a loss of more than £3m last year. This has depressed the share price and provoked heavy criticism. But its significance shouldn't be overstated. Most of the losses occurred in one department, now axed. In addition, there were heavy costs involved in launching the Archimedes, and Arc sales late in the year contributed almost no income. The management expects better results in 1988.

But Acorn is shying away from direct contact with its customers, encouraging them to go to dealers for help: even software developers are feeling cut off. This very small company can't afford to hide from its customers, and refuse to provide support, in the workstation and niche markets it wants to enter.

Graham Bell, Editor

NEWS

FEATURES



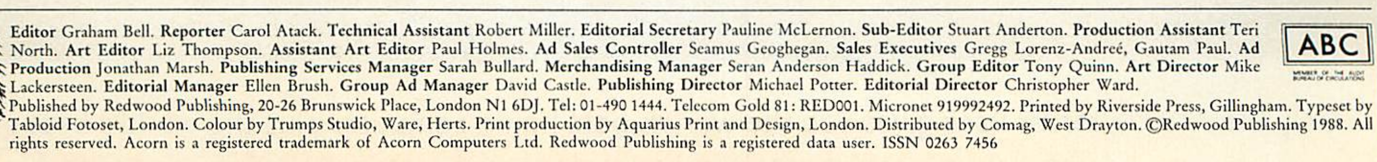


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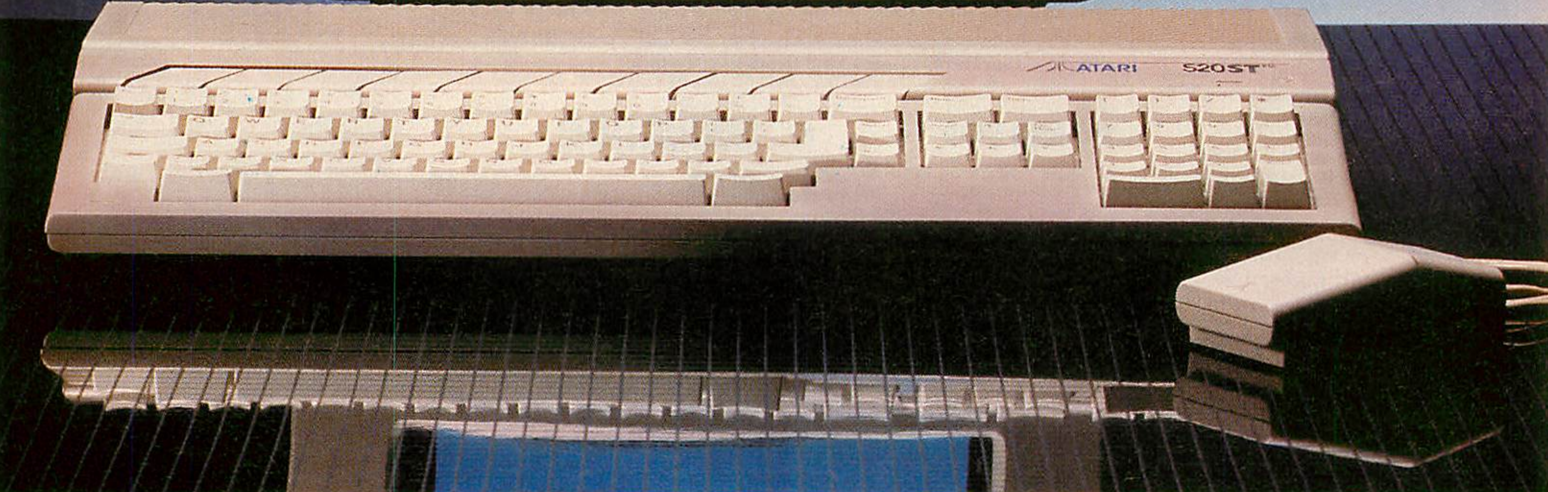


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Each issue of BEEBUG provides 72 pages of articles, programs (utilities, applications etc), tutorials, workshops, reviews, hints & tips, news and information for beginners and experts alike. All our programs are tested on all versions of the BBC Micro, and are also available monthly on disc or tape.

RISC USER

This is the magazine for everyone interested in Acorn's RISC computer, the Archimedes. Launched at the same time as Archimedes, RISC User provides lively and informed coverage of what's happening in the world of Archimedes.

Reviews, hints, programs and articles are all specifically written for Archimedes, showing how to exploit the many features of this sophisticated computer. RISC User is all about the Archimedes; it does not contain modified programs originally intended for the Model B or Master.

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AU6

NEWS

Big bang

The latest disc for the BBC's Domesday AIV player is *Volcanoes*. It was produced jointly with the Oxford University Press and combines text, still and moving images with new AIV features like Hypertext.

To produce the explanations graphics, the BBC's engineers didn't use the Quantel Paintbox, but one of their own Archimedes computers, with *Artisan* software and the Watford digitiser. Maps show where the volcanoes are found. Six example eruptions are shown on the disc.

Other sections explain geological concepts and, give Oxford English Dictionary definitions of terms. A complete geology textbook is included. The disc costs £194.35 including manuals.

C source

Mijas has released a new version of its C compiler for £50. The company claims that it is better and faster, now including full graphics capability with VDU commands and the ability to change mode at any time during the program. The source code is available to users and is itself written in C.

Over the top

Alpine Software has announced a range of new products, and changed its name from Summit Software due to legal problems.

The company's ALP adventure programming language is now available as an Electron ROM with added features compatible with the Plus 3 and most DFS systems.

A 3.5in Compact disc containing a ROM image is also ready at £28.95 and an Archimedes version is promised.

Arthur at risk from Concepts' new OS

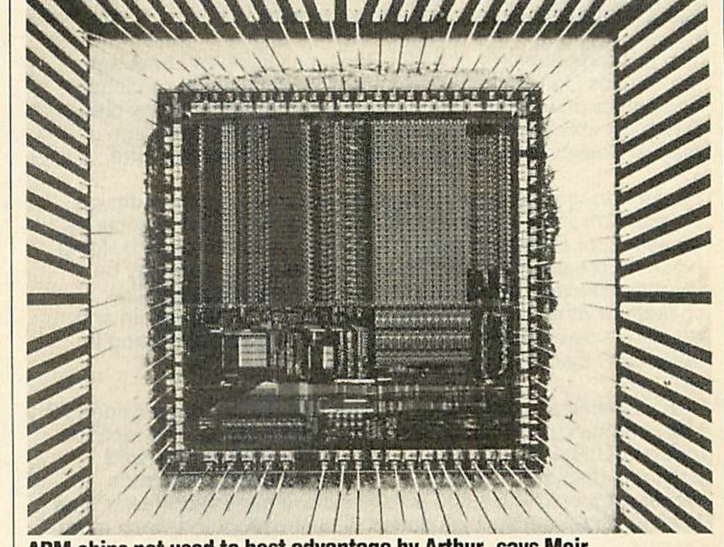
By Graham Bell and Carol Atack

Arthur's place as the Archimedes' operating system is being challenged. Computer Concepts has developed an alternative and future Archimedes releases, including their desktop publishing program, will run under it.

The software, known as Impulse, is being used in-house at Computer Concepts but could be made available later in the year. It may be sold separately or as a package with applications using it.

The company took the decision to write a new operating system when it found that Arthur was incapable of supporting the demands of the DTP program. Both Arthur and Impulse versions of the DTP package will be shown at September's PCW exhibition.

Charles Moir of Computer Concepts said 'We have specific applications in mind that Arthur cannot support. We had no real choice for the DTP program and our other long term developments.'



ARM chips not used to best advantage by Arthur, says Moir

'We have hundreds of requirements which are not met by Arthur,' said Moir, 'one in particular is true multi-tasking.'

An operating system that is much more powerful than Arthur is needed to take on machines like Apple's Macintosh II and Atari's Abaq, claims Moir. 'Perhaps that's why Acorn are turning to Unix.' he suggests. Continuity with the BBC and Master series has been achieved at the expense of exploiting the full capability of the RISC chips.

A fax and modem podule will be available as soon as BABT approval has been granted. It is being shown at May's *Micro User* show. Another idea is for an Impulse-based RISC board for IBM compatibles. This would compete with Acorn's Springboard card, which can be plugged into most PCs.

Second source for ARM chips

Acorn's RISC chip set, used in the Archimedes, now has a second source. Sanyo, the Japanese company best known for TVs and videos, will be supplementing the supplies from US manufacturer VLSI.

Last year 30,000 sets of the four chips were sold, capturing a third of the world market in RISC technology. 'A very large majority went to Acorn' said VLSI's marketing director, Charlie Parr.

He anticipates that Sanyo will use the chip as the basis for controllers for other equipment. Whether this will result in actual products like a laser printer remains to be seen.

'We hope that other companies will produce machines based on these chips and establish a standard,' said Parr. 'Sample quantities have been sold to other companies for development purposes.'

A second manufacturer means greater continuity in supplies to hardware companies, maing the chips more commercial and attractive to other manufacturers.

REALTIME SOLIDS MODELLER

Reviews of the original REALTIME GRAPHICS SYSTEM:
"there isn't anything yet available for the Beeb capable of producing such impressive and powerful graphics"-A&B Computing.
"there is no other software to rival it"-Beebug.
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* The complete 3D Solids/Wireframe package for architectural design, interior design, engineering design, teaching CDT and 3D geometry, molecular modelling, mathematical plots, scientific processing and high speed flicker-free 3D animation.

* Hidden Surface Removal can be performed for full colour realistic solid displays at high speed. The 3D solid images can then be incorporated into other art designs.

* Supports all plotters including HP-GL, Plotmate, Penman II, Hewlett Packard, Epson HI-80, Hitachi 672, Watanabe, Graphtec, Calcomp, Seckonic, Houston DMP, Roland and paper sizes from A0 to A4 for professional results.

* The package consists of a 32k Realtime Graphics Language rom, Solids Design disc, Wireframe Design disc, Multi-plotter and printer driver disc, Demonstration disc, Applications disc, Database library disc and a fully comprehensive 150 page manual designed for complete beginners and experts alike.

* Design facilities include 3D Solid/Wireframe Editors to design objects with lines and surfaces, create symmetrical objects by Sweeping or Extruding simple sections, use objects as building blocks to create more complex objects which in turn may be used as building blocks, specify individual surface and line colours for multi-coloured objects, dynamic 3D viewing in any graphics screen mode and a Data convertor for interfacing to other CAD systems and applications.

* The Solids Realtime Graphics Language (RGL) rom provides 52 star commands to write your own 3D applications. The facilities include 3D Rotation, Scaling, Translation, Perspective and Isometric displays, Orbiting, 3D Turtlegraphics, Geometric processing, unique 35,000 pixels/sec line generator (faster than Acorn's 9000/sec) for high speed 3D animation and many more options.

* The Solids RGL is compatible with all the BBC graphics screen, plotting and colour modes including Shadow screen and is up to 5 times faster than the original RGL. The 32k RGL rom board can be plugged into any 16k rom socket.

* Minimum requirements: BBC B/keyboard/single drive. Also compatible with BBC B+, Master series, all versions of DFS & DDFS. The system will also take advantage of a 6502 2nd Processor/Turbo or AMX/QUEST Mouse. REALTIME SOLIDS MODELLER: £89.95.

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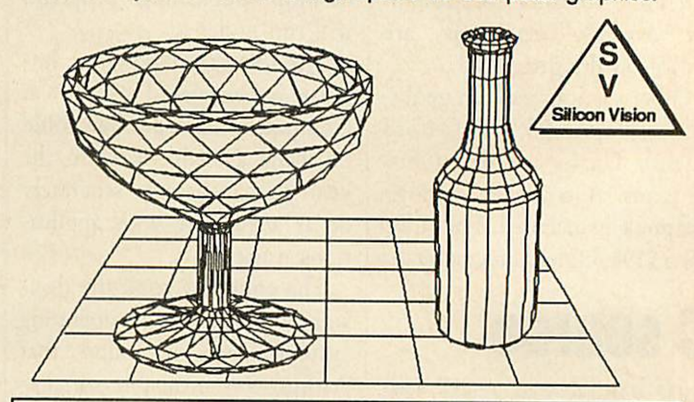
* Once again Silicon Vision steals the lead with this incredible offer. It's true we're offering our international, best-selling wireframe 3D Graphics Development System (3D GDS) at an incredibly low price. No we haven't gone mad, it's simply our way of introducing you to our unbeatable 3D Solids Design & Animation Systems.

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* In the future, you may find that you need a 3D Solid Modelling system for more professional results or more powerful animation facilities for better effects.

* Well, then you'll find no better company to do business with than Silicon Vision. As Europe's fastest growing CAD software house, there's no-one more capable of satisfying your future needs. In the meantime we offer you 3D GDS with our compliments. Worth over £25 it can now be yours for only £12.95 (BBC version) or £19.95 (Archimedes version).

* Minimum requirements: BBC B/single drive. Also compatible with BBC B+, Master series, Archimedes 305 to 440, all versions of DFS, DDFS & ADFS(Archimedes 3.5" disc). Order one today and enter the dynamic world of high speed 3D computer graphics.



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1920x1024 Resolution Breakthrough!
Near Plotter Quality hardcopy at a fraction of the cost.

* At last a printer driver which takes advantage of the highest resolution capability of ordinary Epson compatible printers to provide 1920x1024 resolution as opposed to the 640x256 resolution limitation of most printer dumps.

* Fully compatible with the Realtime Solids Modeller, 3D GDS and all other CAD packages and applications that can produce a VDU text file of a screen image. An example program is included in the package.

* Unlike other printer drivers, Super-Dump does not use screen images directly but instead operates on text files of VDU codes that represent the image to be printed. These files can also be created by your own graphics programs with the addition of two simple *SPOOL statements.

* The package consists of a Super-Dump disc complete with documentation and provides fully proportional dumps at resolutions of 1920x1024, 640x512 & 640x256. Images can also be scaled, positioned and previewed before printing.

* Minimum requirements: BBC B/single drive. Also compatible with BBC B+, Master series, all versions of DFS & DDFS. SUPER-DUMP: £15.95.



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Fast boot

Acorn has reacted swiftly to grumbles that the Archimedes' PC Emulator did not leave much space for applications on 1Mb machines. It has released a new boot program which is quicker and leaves almost double the space – 540k – for applications. Send the original disc plus a cheque for £15 to Acorn Customer Services at Fulbourne Road, Cherry Hinton, Cambridge CB1 4JN.

Lift-off

Market researchers and consultants can turn to a new service from Launchpad Commercial Researchers. This company maintains a huge database of business information with detailed entries on all major companies. For a minimum of £200 they will provide at least 500 entries relevant to your request. These will be sent to you in Viewstore format on any standard BBC filing system, or ASCII files if you prefer.

Spray away

The latest release from Nidd Valley Micro Products is low-cost colouring software Paintbox. It is designed to work with the Nidd Valley Digimouse and the Illustrator graphics package. It includes 22 shades and a random spray feature to keep young Jackson Pollocks happy. The disc-based software is £14.95 for BBC B, B+, Master and Compact, and £29.90 with the complementary Illustrator.

U two

Archimedes users have a wider choice of comms software with the release of U-Connect from Magenta Research Ltd. Written in C and Assembler it offers several terminal emulations, file transfer protocols (including X-modem and Kermit) and modem configurations. Its specification will be bettered by U-Direct, available this summer.

Optimism reigns despite '87 losses

Acorn's announcement of a £3.3 million loss in 1987 caused ripples of concern. Acorn's managers, although dismayed and disappointed, are nevertheless confident that next year's financial results will tell a different story.

'We are running according to budget for the first quarter this year and this is a reflection of increased sales' said corporate communications manager Michael Page.

'Our customers are confident in our products.'

The now-closed custom systems division was responsible for more than two-thirds of the shortfall. Development and launch costs of the Archimedes also played a part.

Sales of the Archimedes are beginning to have their effect on Acorn's balance sheet. The 440, first available in December, has sold in larger numbers than predicted. This has resulted in delivery delays and the further postponement of the lower-specified 410 model. The 410 will not appear until October at the earliest.



Communicator: abandoned

'Demand for the 440 has just taken off' explained Page. Acorn's lack of experience in selling such expensive equipment lead to demand being underestimated. Production lines which were supposed to be making the 410s have had to be turned over to the 440.

Page admits that Acorn would really prefer to sell 440s; a higher price, after all, means a higher eventual profit.

Acorn expected the cheaper models to be the best sellers at first but experience with the 300 series has proved otherwise.

More than 75% of all customers have chosen the more expensive but better equipped 310 model rather than the entry-level 305, and Page believes the same would happen with the 400 series if both models were available.

The 410 is not the only product to be delayed. Following the departure of the head of its development team to Perihelion, a floating point co-processor is unlikely to be released as planned this year.

The Master is also selling better than expected, with an extra 40,000 being built to satisfy demand from educational users.

Archimedes has own Pipedream

Pipedream marches on with a special Archimedes version following the MS-DOS version announced last month. The program originated on the Z88 but is descended from BBC stalwart *View Professional*.

This ancestry makes it an ideal program for use with the Archimedes. All versions are completely file-compatible with each other and with *View Professional*. Arc users with a BBC and with MS-DOS files can transfer files at will from machine to machine – useful if you've got one in the office, another at home and a Z88 to use on the train. The program will cost £114.

Rival wordprocessor *First Word Plus* is now available and cheaper than originally announced at £91. And *Autosketch* will also cost £91. It should be available now, but *Autocad* is considering extra documentation for the Arc version. This will cover extra features such as the software's ability to transfer sprites to *First Word Plus*.

Much more music

Musicians with BBC micros can double the complexity of their work with a new ROM from Electro Music Research. The Pro-performer allows 16 tracks of sound to be created compared with the eight provided by its predecessor the Performer. The price is £69.95 or £52.46 for existing Performer users.

Musicians eager to get their tunes down on paper should add the Scorewriter to their EMR systems, at probably £100 on release.

News in brief

■ Acorn users in Australia will have their first ever show soon. Hosted by Sydney user group Ozbeeb, it is on July 23 and 24 at the Museum of Fire, Castlereagh Road, Penrith, Sydney, New South Wales. Organiser Phil Gothard welcomes ideas and assistance at 483 Pacific Highway, Asquith, New South Wales 2077, Australia.

■ A new book aims to interest 'recreational mathematics' enthusiasts with a selection of puzzles previously published in the trade magazine *Computer Weekly*. The book costs £6.95 and is called *The Computer Weekly Book of Puzzlers*.

■ A Warwickshire company is offering five of its own programs about pneumatics free to teachers. They should send a formatted 40 or 80-track 5.25-inch disc to the Training Centre, Norgren Martonair Ltd, Campden Road, Shipston-on-Stour, Warwickshire CV36 4PX. Tel: (0608) 61676.

■ Callers to the Dudley College of Technology Database can download free educational software for the BBC micro. *Colouring Puzzle* is a maths-based primary program, *Lid-off* looks inside the computer and *Mugger* is a French language program. The college needs volunteers to test a planned second line who should contact David King on (0394) 455433.

Sound sampler and synthesiser for sale

By Carol Atack

The Archimedes should follow the BBC micro's success in making music with two companies' new products.

First on to the bandwagon is Electro Music Research with its *Arpeggio Soundsynth*. This is the first in a range of products which will eventually build up into a complete MIDI-compatible system. It is even compatible with the music editor on the Archimedes' Welcome disc.

The *Soundsynth* program allows users to load, edit, combine and save sounds. They are stored in the form of waves and can be seen as well as heard. EMR plans to sell disc-based sound libraries as well as a MIDI interface for people with their own keyboards and drum machines.

Another sound source is Armadillo's A448 sound sampler podule. It will take sound from any source which can output to the quarter-inch jack plug it accepts; adding a microphone sets up the system for voice sampling. If you tire of distorting voices, use the sampler and *Soundsynth* together to become the next Stock Aitken Waterman; it's surprisingly easy.



Too old to rock 'n' roll? Mike Beecher and friends lay down a groove

Future additions will include devices to help the disabled use the system, developed with Newcastle University, and to record acoustic instruments with Cardiff University.

Mike Beecher, whose company EMR is developing the *Arpeggio* system and selling the podule, believes Archimedes is a natural choice for musicians. 'So many people say the Atari ST is the "music computer" because of its MIDI output, but it's the software and what's inside that's really important.'

He will be demonstrating the Archimedes and *Arpeggio* to musicians at the British Music Fair at the Wembley Conference Centre (July 19-24). The sampler podule costs £126.50 and the *Soundsynth* £49.50.

Arc operating system problems persist

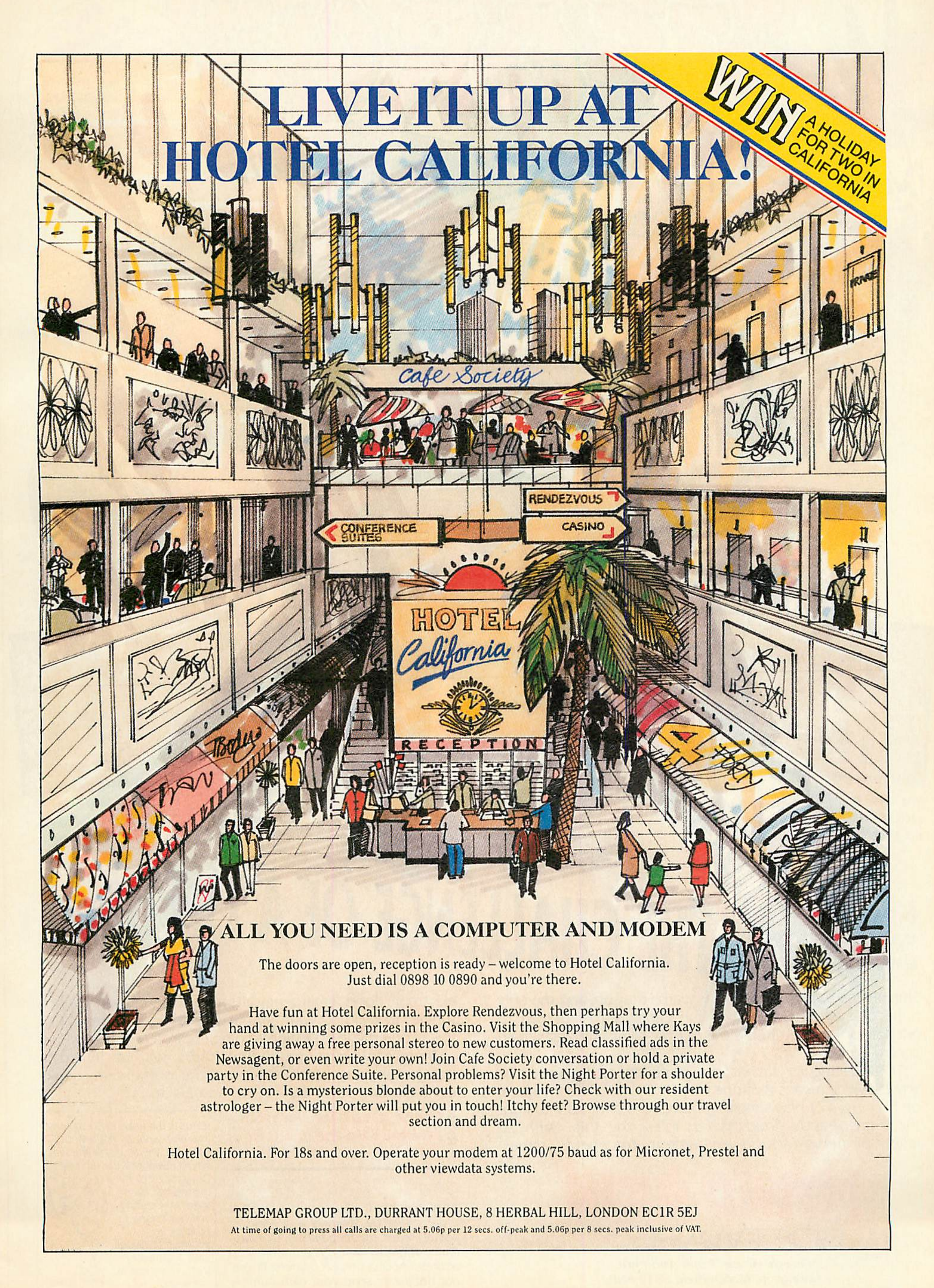
Acorn continues to have trouble with Arthur, the Archimedes' operating system. Version 1.2, intended as the finished version and distributed to users on that basis, has some 100 documented bugs. Occurring in almost every section, from DOS to WIMPs, they are mostly quite obscure.

At the same time the company is minimising difficulties for users by laying down standards to be followed by software developers in their new products. These anticipate changes being made to both Arthur and the associated implementation of C, the language Acorn is recommending to developers.

A new version of Arthur is being developed by Acorn and should deal with all known problems. 'Development work on the operating system continues' said Acorn's microsystems manager David Bell. 'There will be a new, enhanced version but it's quite a long way off. It will probably be next year.'

However Acorn is doing its best to keep software developers, the people most affected by the problems, up to date with the bugs and corrective work. A three page list of problems is attached to the current issue of the newsletter that is sent to software companies.

Software developer Dave Clare said 'The bugs are to be expected. They're mostly quite obscure and just something we have to work around. It's good of Acorn to have let us know. A lot of people pretend bugs don't exist.' He points to other operating systems which have taken several years to develop and improve..



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Split-screen action with different views for each player. When you are both in the same area the views are the same.

Crack the code to the forcefield, pass through the portals to raid the area of valuable credits, then head for the lift.

Now *TWO* can play – and experience . . .

THE CHALLENGE OF A LIFETIME!

Starship Icarus is plummeting towards the sun, and the only hope of averting the impending cataclysm is for you to teleport on board, disable the master computer and regain control . . .

This spectacular fast-action game has a unique split-screen which means that one player can complete the game on his own – or play simultaneously with a friend – to fight the trigger-happy droids which infest the ship. With 20 levels of nerve-racking excitement, forcefields, mines, electronic doors, emergency lifts, movable walls, and opportunities to build up your armour, blaster and health ratings, this is one game you won't complete in a few weeks!

There can be no doubt that Icarus, with its incredible one- or two-player action, is one of the most exciting games ever created for the BBC Micro and Electron.

Check it out for yourself – and take up the challenge!

Icarus is the result of six months' intensive work by Powerhouse Software, the programming team which developed the top-selling Dunjunz. A full three months has been spent play-testing and fine-tuning to produce an addictive challenge with a gameplay that's really out of this world!

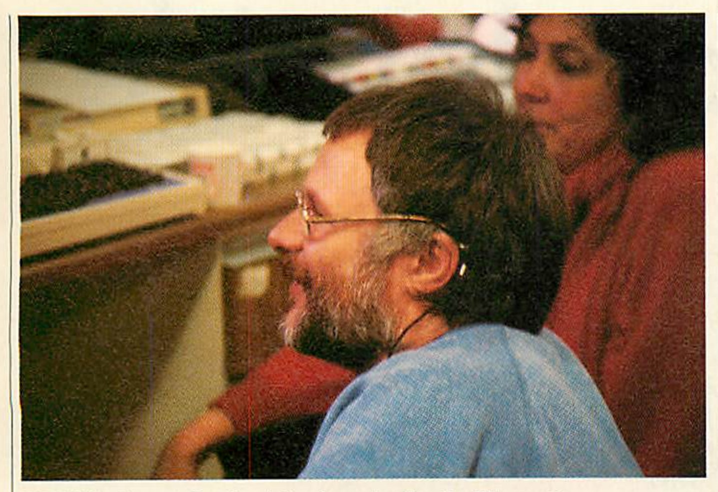
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Bill Oddie, former Goodie, interviewed online by Micronet

Bird man backs the Great Worm Hunt

Acorn User's Great Worm Hunt activities spread to Micronet one Wednesday evening when birdwatcher Bill Oddie was interviewed on-line by the Prestel-based magazine. Speaking both as the vice-president of the British Trust for Conservation Volunteers and as a former Goodie and comedian he answered questions sent in by readers.

His answers were typed into the BBC B that Micronet uses for its chatlines by writer Paul Needs. However, Bill typed in his name in response to requests for autographs.

A competition on Micronet was part of *Acorn User*'s contribution to the BTCV's Great Worm Hunt. By calling up the competition page entrants automatically donated 25p to the BTCV. One hundred and fifty entries were received and the winners will be announced in *Acorn User*.

More information is available from Tim Boote at the BTCV, 80 York Way, London N1 9AG.

Frenching

The famed French Teletel system is a largely untapped resource for language teachers and learners but has always been difficult to access from the classroom.

Harrogate College of Arts and Technology's previous Teletel emulation package proved a success with schools with comms facilities.

Now the college's computer unit has released a disc of real Teletel pages. No more expensive phone calls but it still provides authentic French information based on tourist facilities in the Limousin. The £24.95 pack includes documentation.

Ink free

The journalistic exodus from Fleet Street has reached computer programs with the release of Watford Electronics' *Wapping Editor*. The price has not yet been set for the PALPROM-based program but it is likely to be around £50. It is compatible with all BBC models from B to Compact and also with the *Quest* range of programs.

The freehand drawing module is like *Quest Paint* but in screen mode 0. Other features are a wordprocessor, font designer and page make-up facilities. Several fonts are provided and text can be imported from *View* and *Wordwise*.

THE COMMS COLUMN

■ Over the past year or so, there has been a phenomenal growth in value-added services, the special telephone numbers on exchange 0898 or with the double zero prefix which recover their costs by high call charges, a percentage of which is paid to the operator by BT. Although obviously most of these services have been voiced-based, the first two data systems have been launched.

Desire, which runs on (0898) 555555 on Prestel and scrolling standards, contains a bulletin board, email, classified ads and a problem page. Hotel California is a similar system run by Telemap, operators of Micronet 800, on (0898) 100890. This contains a casino, where games can be played for money prizes, teleshopping, teleconferencing, as well as offering the same features as Desire.

Both systems are non-technical, aimed at a general audience. If calling these services, remember that they are very expensive – 25p a minute at cheap rate times, 38p a minute at peak times. That's over £20 an hour! Nevertheless, getting a simple system of payment for use of online services has long been a problem, and the BT charging structure, which avoids the need for pre-registration, may be very useful in this respect.

How long before we see serious business databases using this system? For further information telephone 01-583 4303 (Desire) and 01-278 3143 (Hotel California).

■ Micronet 800 has undergone a re-launch with a new managing director, John Tomany; a managing editor, Francis Jago: and a new advertising campaign. The main alterations are a general tidying up of the news and machine-specific areas, which over the past few years have grown in a rather uneven fashion. The BBC section is now updated every Monday, rather than at irregular times as before. All non-micro related material is now split off into a separate area called Xtra, and the micro news section, a very popular area, has been reorganised to make stories easier to find.

■ Telecom Gold celebrated its sixth birthday and announced that the service now has 105,000 active users. Phil Madden, head of sales, said, 'I am delighted that on its sixth birthday, Telecom Gold can announce that its users now run into six figures.' The international Dialcom network has 250,000 users, all of whom can be contacted on Gold in the same way as UK subscribers.

■ Bulletin board spotlight this month falls on Phantom Viewdata, a Viewdata standard board in Barnsley run by Keith Burton. The board exists to broaden public awareness and knowledge about all micro-based subjects. About a quarter of the system is free to anyone, but to see it all you need to subscribe (£6 a year). Phantom Viewdata can be called 24 hours a day on (0226) 732140 at 1200/75 baud. Keith Burton can also be contacted on Prestel mailbox 919998422.

■ Microlink is running an experimental colour system for users of ANSI/VT102 terminals. To use the system you need an ANSI terminal which supports colour in 80-column mode. This is impossible on a BBC, but may be possible on one of the up-and-coming Archimedes terminal programs. If you think you have a suitable terminal try typing TY MAG043>PCGOLD1 while online, and if it works, send MAG043 a mailbox to say so.

If you have any comms news for David Atherton, you can write to him here at *Acorn User*, or through his mailboxes on Prestel 942876210 and Telecom Gold 72: MAG11596.

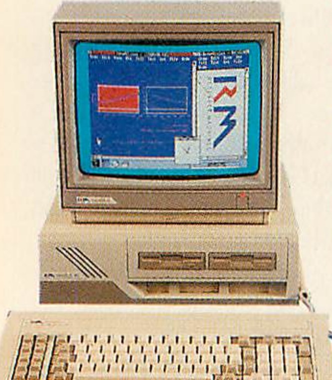
David Atherton

The RM Nimbus is on everybody's side.

Most 'educational' computers force you into a trade-off. You can have high speed – and very little software. Or slick DTP – on a screen like a letterbox. Or business roots – with little interest in education's special needs. (You can guess which machines we're talking about.)

Ten years of direct commitment to education have taught RM to do better. We know that computers aren't just for the elite. Skills must be spread around. The ideal machine must be an all-rounder: fast, networkable, with powerful graphics – and above all carrying a vast stack of software. And that describes the RM Nimbus.

Our Transitional Support Programme means that you can keep your bank of programs in BBC Basic.* PC compatibility gives you MS-DOS.* High-powered Nimbuses can run OS/2* or UNIX.* In short, we combine the riches of the main software traditions of the past, the present and the future. No wonder 90% of 16-bit computers in education are Nimbuses.

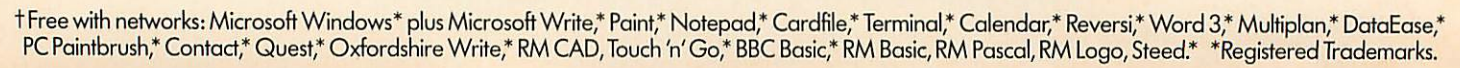


If your school installs a Nimbus network, much of this software is supplied free.† In fact, RM's list of *free* software is almost as long as some machines' list of *available* software.

Rather than one virtue – the Nimbus has many. Too many to list here. For more about the great all-rounder, contact us on 0865 791234, or write to Research Machines, Mill Street, Oxford OX2 0BW.







† Free with networks: Microsoft Windows* plus Microsoft Write,* Paint,* Notepad,* Cardfile,* Terminal,* Calendar,* Reversi,* Word 3,* Multiplan,* DataEase,* PC Paintbrush,* Contact,* Quest,* Oxfordshire Write,* RM CAD, Touch 'n' Go,* BBC Basic,* RM Basic, RM Pascal, RM Logo, Steed.* *Registered Trademarks.

Baker joins CBI to forge IT links

Integrating computers across the curriculum is a vital step that all schools must take, Kenneth Baker told industrialists at a CBI conference in London. It was vital for Britain's future success that all school-leavers were computer literate; the 'skills shortage' was one of the greatest problems facing British industry at the moment and the difficulty would increase as the number of school-leavers began to decline.

The NCET, or rather the part of it which used to be MESU, had invited several schools to share its stand in the small exhibition which was part of the conference. The minister referred in his speech to the children demonstrating their work on these stands. Their ability and confidence with the computers should be matched by all children and all adults as well, he said.

The conference, *New Technology for Better Schools,*



Baker: integration is vital

sprang from the CBI's investigation of links between schools and industry. Delegates from companies including British Gas, BP and Unilever met to discuss government policy on IT and ways in which businesses could help schools. Dr Donald Grattan, chair of the NCET, explained the organisation's role in evaluation technology for schools and providing ideas for its use.

Staffordshire's chief education officer Dr Philip Hunter explained how computers are used in the classroom, and John Wilson outlined some of the resources available. Other speakers detailed particular case studies to the delegates.

The schools' stands showed the Domesday machine in action, various Lego vehicles, and Morecambe High School demonstrated a program and gadgetry to control the feeding of a tropical fish collection while its owners were on holiday. One school brought its DTP system, produced a newsletter and presented a copy to the minister after his speech. Baker also used the platform to ask industrialists to increase involvement with their local schools both by giving teachers industrial experience and by acting as school governors. But some delegates thought that too little support was given to teachers already working in cooperation with industry.

Mary Rose sails again

The raising of the Tudor warship Mary Rose is the subject of a simulation from Cambridge Software House. It has been prepared in co-operation with the Mary Rose Trust.

With the 400th anniversary of the Armada, the software's release coincides with a number of television programmes on the Tudor navy, the sinking of the Mary Rose and its later re-discovery.

The pack includes a range of support materials including a colour booklet, slides and postcards. The software is entirely new, and not a re-write of the existing Ginn software of the same name.

Shell sell

A graphing package for the Archimedes called *Mouse Plotter* comes from the Shell Centre for Mathematical Education.

The software can use *Quest, Inform* and *Grass* files, among others, and can recognise the type of data file automatically. The program is easy to use and takes care of scaling on its own.

The Shell Centre has also released a disc containing many of the popular ITMA packages. Details are available from the Shell Centre.

Econetworking

The next Econet Conference - *Econet '88 – Econet Plus - Educational networking for the nineties* will take place at Newman College, Bartley Green, Birmingham on Monday and Tuesday, September 12 and 13.

The conference will be jointly organised by Acorn, Network User and *Resource*. A comprehensive exhibition will accompany the numerous lectures and seminars which, last year, attracted nearly 200.

EDUCATION OPINION

The quality of the Archimedes wordprocessor, *ArcWriter*, is inadequate for educational purposes. We have monitored its poor performance and condemn both its lack of speed and unreliability.

Our criticisms are levelled at shortcomings such as the extended loading time for even comparatively short documents and at its lack of robustness – in tests the software 'crashed' twice.

Another drawback is the fact that there was no apparent means of preventing the print-out from being double-spaced, and most of all there is a general impression of rather hasty preparation.

It seems strange that, on the 'fastest micro in the world', Acorn's chosen wordprocessor package should in practice be such a poor performer.

At present the only competition to *ArcWriter* is the Clares *Graphic Writer* which enables the inclusion of graphics in printed texts, and Acornsoft's own *First Word Plus* package.

Nick Evans and Chris Drage

PC progress

A researcher who is trying to discover which MS-DOS packages won't run under the Archimedes' IBM PC emulator has been having quite a hard time – she has yet to find one package which fails!

Lesley Chetland of Simnetts has been testing commercially available programs for Acorn, and the few she originally found to be incompatible have been made to work by modifying the emulator.

The latest version of the emulator is available from Acorn and existing owners can return their original discs and upgrade for a fee of £15.

Arc packs on show to LEAs

Acorn has offered all computer advisers a package of software to show off the capabilities of the Archimedes.

The programs include *Artisan*, Clares' graphics package, the *System Delta Plus* database from Minerva, and *First Word Plus* and *Logistix*, both of which were originally IBM PC business software.

The offer comes as the battle for the hardware element of the Government's Education Support Grant between Acorn, Research Machines and Apple reaches new heights.


Clares' *Artisan*: given away

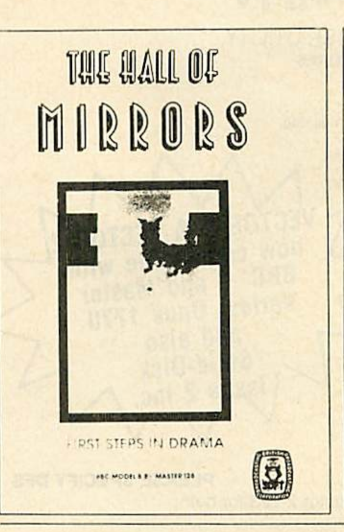
Acorn believes the Arc technically out-classes RML's Nimbus machine.

In response, Research Machines points to the lack of software for the Arc compared with its own machine.

RML also cites the sophistication of new developments on the Nimbus, such as the controversial Windows 2 operating system, over which Microsoft is being sued by Apple.

Meanwhile, Apple insists that despite the guidelines issued by the DES, its easy-to-use Macintosh micro has a place in the classroom.

Apple is expected to be promoting itself very heavily in the education market in the months to come.



On reflection

BBC Soft has the entered software for drama market with a new release, *Hall of Mirrors*. It is an adventure in four parts which cover a whole realm of dramatic activities. The program may be used as an adventure game in its own right and, although it is based on a successful radio series for schools entitled *First Steps in Drama*, the software is not dependent upon that input.

NCET chair finalised

The governing body of the National Council for Educational Technology (NCET), the new organisation formed from the merger of the CET and MESU, has been finalised by Kenneth Baker.

The Education Secretary announced that the governing council will include regional representatives from Scotland and Northern Ireland, not previously covered by MESU.

Other council members include Dr Ian Birnbaum, former chair of the advisers' association and Mike Nichol of MESU. Donald Gratton, formerly of the CET, will chair the council. Also represented are all levels of education, plus industry and commerce.

The NCET's brief is to 'offer an integrated service covering the range of educational technology', but it is intended to be more efficient than its predecessors. Staff cuts are likely.

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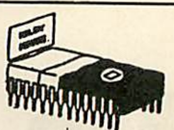
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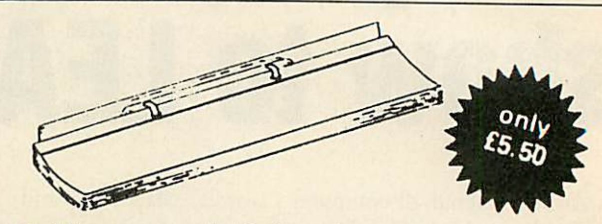




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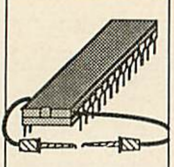
ARC DESKTOP + TRANSFER SOFTWARE.

This software is an enhanced desktop for the Archimedes ((C) Acorn computer Ltd) , and has the following functions:-
SCIENTIFIC CALCULATOR, A 30 function scientific calculator with a facility for number conversions.
CLOCK, A clock with a difference ! . Big ben digitised and incorporated in the archimedes desktop.
DIARY, Same design and function as Acorns standard diary.
NOTEPAD, An improved version of Acorns notepad, with direct pointer driven input.
PALETTE, A Palette of the same design as the Acorn Palette.
BBC CONVERTOR, This program blends into the desktop, when a RS232 lead has been connected between the BBC and the Archimedes select the 5.25' disk icon and a window showing the files on the BBC B disk drive appears on the archimedes. To load files just select them with a mouse (as many as you want) , and from the desktop menu select load to make the files transfer automatically from the BBC to the archimedes. The baud rate is set at 19200 baud although any speed can be used, the Convertor is intelligent and recognises automatically the file types contained on the BBC's disk drive.
EDITOR, This is an optional facility for editing source text files for compilers (FORTRAN, C, PASCAL etc), to work it must be used on at least a 310 (this is not a disadvantage as none of the compilers are able to work on a 305). This advanced program blends fully into the desktop enviroment, and is very user friendly and intuitive in its use, the maximum text size is 2000 lines. The files produced are compatible with twin, it is entirely WIMP driven and needs no control/function keys.
The basic editor functions included are string search, search and replace, load, save, merge, print, clear.

"This kit from Brainsoft can be thoroughly recommeded" from review in Archive magazine December 1987.

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Also provided on the disk are three BASIC programs which can be easily adapted to run on NETWORK systems, ramload, ramsave and ramlist.
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Wait for it

For readers and advertisers who have been asking about this year's *Acorn User* Exhibition, we're still negotiating with Acorn on relaunching the event at a different time of the year. Unfortunately there won't be a Show in July this year, but we'll keep you informed on progress.

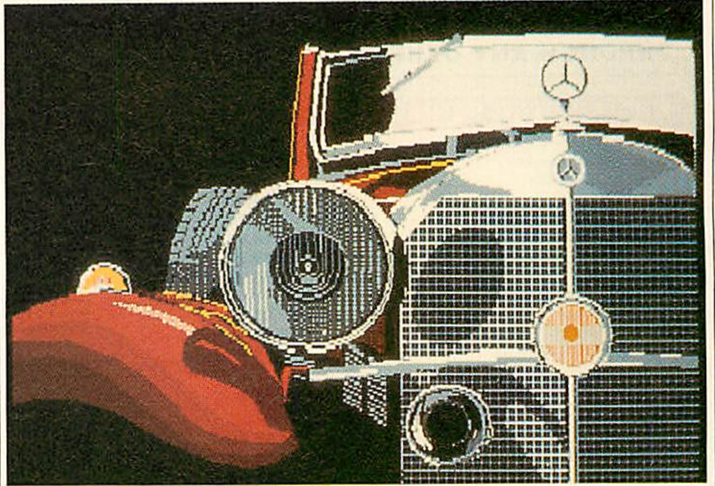
Competition roundup

After checking what seemed like and were indeed hundreds of your programs we are finally able to announce the winners of our C competition from the December issue.

A copy of Acornsoft C each goes to J Thewlis of Watford, M Glass of Truro, CK Semmens of Tong, Isle of Lewis, MRV Jansen of Lisse, Holland, MJ Dumbrell of Shepperton, D Knell of Leamington Spa, R Whiteley of Belfast, S Cree of Bebington, M Boura of Lincoln, and to A Storkey of London N14.

We would like to apologise for the delay in judging this competition.

We are also able to announce the winners of last month's Abuser competition in which the prizes were copies of *Arctist* from Fairhurst Instruments. These will be going to Mrs Walling of Exeter, Bruce Goatly of London SW1, Paul Rolfe of Boston and Roger Battley of Oxford.



This month's Artisan winner, E Wragg's Mercedes

The pictures submitted to our long-running *Artisan* competition have been of a very high standard and this month's winner is no exception. E Wragg of Hounslow's portrait of a classic car (see above) wins this month and he will soon be receiving his box of discs. The *Artisan* competition is now closed; thanks to Dave Clare for his help and the prizes.

Next month we will announce the final winner whose entry will be turned into an oil painting by Clares' resident artist Jon Warmisham, a judge along with Dave Clare and *AU*'s group editor Tony Quinn.

BLUNDERBOX

Owners of Epson LQ series and NEC 2200 printers should take a look at the screen dumps (modes 0, 1 and 4) printed in the April and May issues. These were under the Top of the List heading in Yellow Pages and some people appear to have missed them.

No-one has spotted any errors in the May issue except for Listing 4 in Hints and Tips. Line 660 should be a colon (:) not the single floating dot which appeared in some copies.

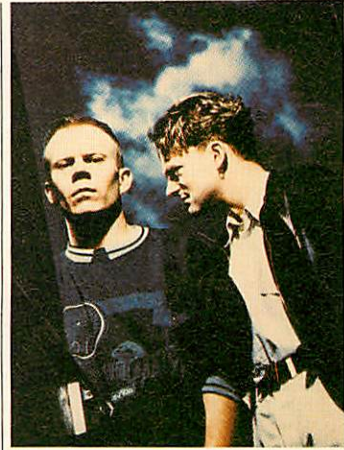
Finally a reminder that in the April issue the last two diagrams in Step by Step were transposed, so that the 'Reading in write' illustration appeared in 'Writing the balance.' Bruce Smith's *Viewsheet* demonstration files mentioned in the article finally appeared on our Mau disc.

Record prizes

If you've read our interview with top group Erasure and are wondering just what they sound like, their record company Mute has given us 10 copies of new album *The Innocents* on LP or cassette to give to you.

All you have to do to book your berth on the ship of fools for hours of listening pleasure is answer these three quetions. Send your answers on a postcard or the back of an envelope, with the competition voucher attached firmly, to Acorn User Erasure Competition, 20-26 Brunswick Place, London N1 6DJ to reach us by June 20.

1. Who invented the electronic sound synthesiser?
2. Which company first developed the MIDI standard?



Are these men *Innocents*?

3. Vince Clarke has had hits with three groups other than Erasure; name them.

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U-CONNECT

Communications Software for Acorn Archimedes computers

U-Connect is a general-purpose, but full-featured communications software package written specifically for the Archimedes range of computers, using a combinations of assembler and 'C'.

U-Connect runs exclusively within the Archimedes WIMP environment, fully utilising the concepts of multiple windows, icons, and pop-up menus to provide an easy-to-use, flexible, and attractive mouse-driven package.

U-Connect provides:

Terminal Emulations – Teletype, VT52, VT100 and VideoTex (Prestel)

File Transfers – ASCII, X-Modem, Kermit, CET (Prestel Download)

Screen Review – view past text/frames in separate scrolling window.

Modem Drivers – support for all common types of modems, fully user configurable (Hayes, Dacom, Pulsed, and Dumb supplied as standard).

PhoneBooks – Multiple phonebooks allowed, each with 40 entries, defining phone numbers, logon, function keys etc., allowing the complete environment to be pre-configured automatically before connection.

U-Connect is ideal for the Archimedes User who wishes to connect to remote computer services, such as Bulletin Boards, Online Databases, Conference Systems, E-Mail systems etc. It is supplied on 3.5" disk, with a comprehensive user manual covering all aspects of the package.

U-Connect is the first in a range of Magenta Research software packages planned for the Archimedes over the coming months.

Price: £59.95 inc VAT & p+p (outside UK add £4 p+p) Send cheque or PO to:

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- ★ a set of three cards showing the Braille, Moon and Manual alphabets

Target age range:
although aimed at children aged 9+ many 7 year olds have spent hours exploring WWW

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★ **SEND TO:** 4Mation Educational Resources
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Rock Park, Barnstaple,
Devon. EX32 9AQ
Tel: 0271 45566
TTNS Box. 01:YNK045.

★ Please remember to enclose cheque or L.E.A. order.

4Mation

PINEAPPLE SOFTWARE

Programs for the BBC model B, B+, Master and Master Compact with disc drive

DIAGRAM II now also available for ARCHIMEDES

Diagram II represents a major breakthrough in the techniques used for drawing software on the BBC micro. It works on a completely different principle to other drawing software by storing the drawing information straight to disc as coded 8*8 pixel blocks.

This technique has three major advantages. First, the size of the diagram is only limited by the amount of space on disc. Second, there is no limit to the amount of information which can be stored on a given diagram as the information is stored on disc and not in computer memory. Third, the disc storage technique allows the smooth scrolling of the screen over the whole surface of the diagram.

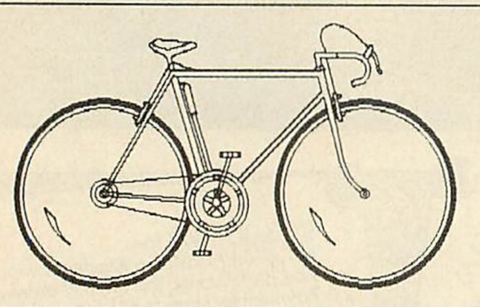
For people not familiar with Diagram, the basic operation of the program is to first display any part of the diagram, either by quoting an index name or screen number. At this point you are free to scroll the diagram around the screen using either cursor keys, trackerball or mouse. You may stop scrolling at any point and enter the edit mode which allows you to modify or add new information to the diagram. When you have finished making alterations, the new information is stored to disc and you are free to scroll elsewhere on the diagram stopping to edit at any time.

The edit features are now very comprehensive. Text may be typed straight from the keyboard, and if other fonts are stored as user defined characters then these fonts may be printed using the normal keyboard keys.

The print routines are now completely 'scaleable' with both the horizontal and vertical scales being totally variable in 1% steps between a size that will give 18 mode 0 screens on an A4 sheet and a size that would print just one pixel on a sheet! The routines are adaptable to most types of dot matrix printer and full advantage may be made of wide carriage printers. The printouts may be rotated through 90 deg. if required.

The new editing features make DIAGRAM II suitable for all types of serious drawing application including scale drawings, flow charts, architectural, family trees, and many other subjects as well as circuit and schematic diagrams. As an example of what Diagram II can do, this complete advertisement (with the exception of the PCB drawing) has been produced with the package.

1. Works on any model BBC computer with either DFS or ADFS.(ADFS only if Shadow memory available).
2. Will automatically take advantage of shadow memory (any make) to provide more User Definable Characters, 880 with Shadow, 381 without Shadow.
3. Rapid horizontal and vertical line drawing routine with automatic joins for circuit diagrams.
4. Full rubber band line drawing and circle drawing modes.
5. Takes advantage of the Acorn GXR rom to provide drawing of arcs, sectors, chords, parallelograms, ellipses, and flood filling. Note this rom is already fitted to Master and Compact machines.
6. Pixel cursor drawing and deleting mode allows very fine detail to be added.
7. Defined areas of screen may be moved, copied, deleted or saved to disc.
8. On-screen indication of cursor position shows either the cursor position on the overall diagram or the distance from a preset point.
9. Keyboard keys may be predefined to print User Defined Characters, enabling new character sets to be stored as user defined characters and then printed straight to the screen using the keyboard keys.
10. Wordprocessor files may be loaded to the screen and automatically formatted into any shape screen area.
11. Index names may be set up to point to given areas of a large diagram, to enable rapid access to a given point on a diagram.
12. Fully compatible with Marconi trackerball and most makes of mouse.
13. All Diagram 'Utilities' are included, enabling screen ident numbers and borders to be added, and any area of diagram to be moved or copied. The whole diagram may be displayed in reduced scale (either 4*4 or 8*8 format) on a single screen, and the size of the overall diagram may be increased or decreased.
14. Completely scaleable print routines allow any area of the diagram to be printed either horizontally or through 90 deg. in scales that may be varied in 1% steps allowing up to 18 mode 0 screens to be printed on an A4 sheet (still with readable text).
15. Complete with 40 page easy to understand handbook.



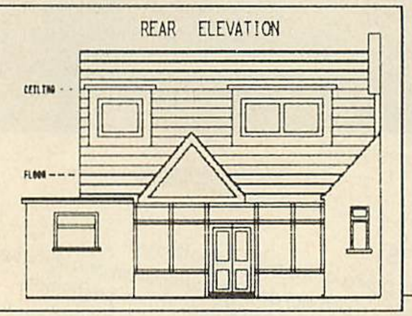


Diagram II consists of a set of disc files and a 16k Eprom. The disc supplied is formatted in 40T on side 0 and 80T on side 2. Please state if this is unsuitable for your system, or if you require a 3.5" Master Compact disc.
ARCHIMEDES version on 800k 3.5" disc.

DIAGRAM II — £55.00 + vat

P & P free (except overseas)

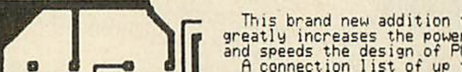
N.B. Upgrades are available to existing Diagram owners. Please contact Pineapple if you have not received an upgrade letter.

PCB

Pineapple's now famous printed circuit board drafting aid produces complex double sided PCB's very rapidly using any model BBC micro and any FX compatible dot-matrix printer.
The program is supplied on Eprom and up to 500 component and 500 ASCII component descriptions may be stored for each PCB. There is no limit to the number of tracks that may be stored for a given PCB although the maximum board size is restricted to 8" * 5.6".
Using a mode 1 screen, tracks on the top side of the board are shown in red, while those on the underside are blue. Each side of the board may be shown individually or superimposed. A component placement screen allows component outlines to be drawn for silk screen purposes and component numbers and outlines entered on this screen may be displayed during track routing to aid identification of roundels.
The print routines allow separate printouts of each side of the PCB in a very accurate expanded definition 1:1 or 2:1 scale enabling direct contact printing to be used on resist covered copper clad board. The print routines are very fast taking typically 5 minutes for a 1:1 print of a 7" * 5" board.
This program has too many superb features to describe adequately here, so please write or 'phone for more information and sample printouts.

PRICE £85.00 + VAT

Plotter Driver to suit most plotters £ 35.00 + vat



PCB AUTO-ROUTING

This brand new addition to the PCB program greatly increases the power of the software and speeds the design of PCB's even more.
A connection list of up to 190 connections may be entered in the form of a 'rats nest' and then the computer does the rest!
You may specify which side of a board you wish the track to be on or leave the choice to the computer, and you may also say whether tracks should be allowed to pass between I.C. pins. Tracks may still be drawn manually at any time so boards may be produced by a combination of manual and auto techniques if required.
The program is in the form of a second Eprom and all the features are available even with an unexpanded model 'B' computer.
Please write or 'phone for full details.

COMPLETE AUTOROUTE PACKAGE (including manual eprom) **£ 185.00 + VAT**

MARCONI TRACKERBALL

This high quality device comes in three versions. Version one is for the standard BBC micro and comes with the Icon Artmaster drawing package from Micro-Draw, and Trackerball Utilities which allow the trackerball to be used with other software.

Version two is for the Master 128 computer and this comes with the Pointer Rom. This is a Rom which allows the Master to be configured for use with the Trackerball and has commands to enable the Trackerball to intercept the cursor key or joystick routines of other software. Commands are also available to reverse the axes of the trackerball and set the sensitivity. The three buttons may also be set up to produce any ASCII code.

Version three is simply the bare Trackerball which comes without software but is suitable for use with specially written software such as Diagram or Diagram II.

Trackerball adapters are also available which plug onto the end of the cable and convert the connections of the trackerball to be the same as a mouse. This enables the trackerball to drive all types of 'mouse' software.

For Model 'B' and B+ (with Icon Artmaster)	£ 60.00 + vat
For Master 128 (with Pointer Rom)	£ 60.00 + vat
Bare Trackerball (no software)	£ 49.00 + vat
Pointer Rom - available separately	£ 12.50 + vat
Trackerball to mouse adapters	£ 8.00 + vat
Postage & packing on Trackerballs	£ 1.75

MITEYSPICE

Miteyspice is a very powerful AC & DC circuit analysis package with graphics suitable for use with any model BBC micro including those with 2nd processors.
As well as all the usual facilities available with this type of program, non-linear effects, small signal, noise measurements and sweeps may be performed. Component values may be swept, allowing component tolerances to be investigated as well as thermal performance etc. Comprehensive transistor modelling is incorporated using a 20 parameter Ebers Moll description. The program is supplied on disc with a very comprehensive 49 page manual.

PRICE £119.00 + vat

ADFS Utilities Rom — ADU

ADU is an invaluable utility for all ADFS users. It adds over 22 new *commands to the ADFS filing system as well as providing an extensive Menu facility with over 35 sub commands covering areas such as repeated disc compaction, saving and loading Rom images, auto booting of files and many more.
Copying of DFS discs onto ADFS discs can be made in one pass with automatic creation of the required directories on the ADFS disc. All functions are fully compatible with Winchester drives including *BACKUP which allows backing up of Winchesters onto multiple floppies.
Additional *commands include:- *ADU, *BACKUP, *CATALL, *CHANGE, *DFSDFS, *DIRALL, *DIRCOPY, *DIRDESTROY, *DIRRENAME, *DISCEDIT, *DRIVE, *FILEFIND, *FORMAT, *KILLADU, *LOCK, *MENU, *PURGE, *PWRBRK, *UNLOCK, *VERIFY, *VFORMAT, *WIPE

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Microlink number mag 12085 All orders sent by return



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Access

DABS PRESS

Dabhand User News

David Atherton and **Bruce Smith** bring you the latest in Expert Software and Dabhand Guides for your Acorn micros.

If you have a printer then we believe HyperDriver will be one of the most significant purchases you can ever make.

Here's what **Beebug** said about it: *"...an ingenious blessing.. a million other good design features..."*

C: A Dabhand Guide Hot off the presses, and in our opinion *the* definitive guide to this remarkable language. Covers the Archimedes, BBC & Master. Don't miss it!

Master Operating System: The Master owners bible now in its 2nd edition. Do you have a copy?

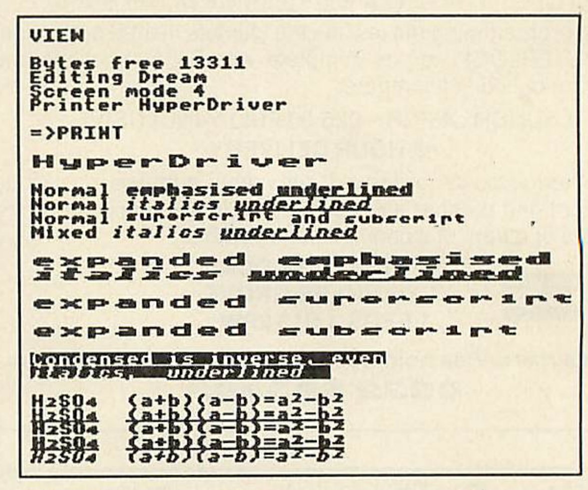
Send or phone for our FREE 32 page catalogue which contains full details on all our products.

HyperDriver: Printer Power

Possibly the most significant purchase you can ever make.

HyperDriver isn't just another printer ROM – it's the *ultimate* one. It's absurdly easy to use and provides you with so many of the facilities missing from your current printer orientated software including: on-screen preview, CRT graphics, NLQ font, and user definable macros to name but a few.

The integral VIEW printer driver means that it is as easy as pie to gain access to *all* your printers facilities. Every effect is just a simple two letter command away! The on-screen preview allows you to see exactly how your text will look *before printing*.



Price: Just £29.95 for ROM, disc and 100 page user guide.

MOS Plus

A must for all Master 128 owners not least because it fixes those irritating bugs in the OS and adds many essential extras such as *SRLOAD, *FORMAT and *VERIFY in ROM, and Archie-type commands such as *ECHO and new *CONFIGURE options including COLOUR, and START. Beebug said it all in their recent review: "*MOS Plus is an excellent product.*"
Price: 16k ROM £12.95, SRAM version £7.95 (£9.95 on 3.5").

C: A Dabhand Guide

Spread over an amazing 512 pages this highly readable Dabhand Guide will leave you in no doubt as to the natural successor to BBC BASIC. Covers C on the Archimedes and Master, and at only £14.95 represents superb value for money!

Master Operating System by David Atherton

A&B said it is "*invaluable*". Only £12.95 or £17.95 with disc.

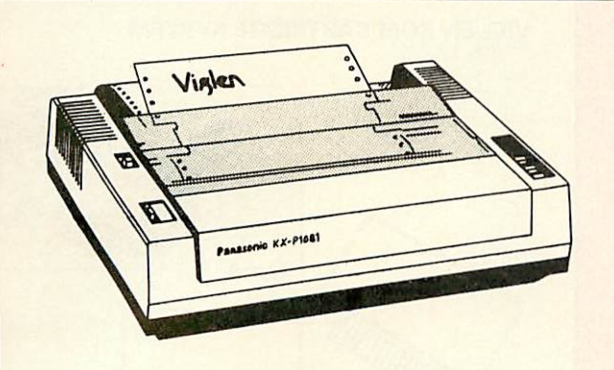
Orders

Send cheques, POs, official orders to the address below, or quote your Access/Visa card number and expiry date. Credit card orders accepted by phone or mailbox. P&P free in UK. Elsewhere add £2 or £10 airmail. 3.5" ADFS disc £2 extra.

Dabs Press, 76 Gardner Road, Prestwich, Manchester, M25 7HU. Phone: 061-773-2413 Prestel: 942876210 BT Gold: 72:MAG11596

SPECIAL OFFERS FROM VIGLEN

PANASONIC PRINTER KIT



The Panasonic KX-P1081 come complete with £45.00 worth of accessories FREE including tractor feed and roll feed units with paper, printer cable, and a specially designed metal printer stand.
Features include:

★ 120 cps draft printing 24 cps NLQ
★ IBM and Epson compatibility through dip switch settings
★ Prints 80 coloumns on A4 cut sheets, continuous stationery or roll paper 9 × 9 draft and 18 × 23 NLQ

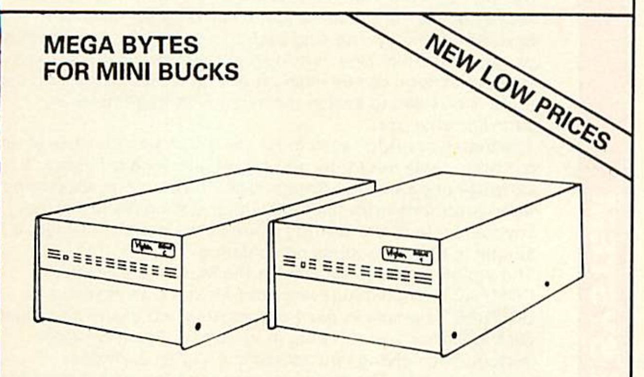
Stock Code	Description	Price inc. VAT
SP079	Panasonic KX-P1081 plus accessories	£185.95

Please add £8 for insured courier delivery.

WINCHESTER

MEGA BYTES FOR MINI BUCKS

NEW LOW PRICES



Plug in 20 to 112 Megabytes of extra storage with the Viglen Winchester system.
The Viglen Winchester is ready to plug in and use on a BBC Master micro; for a BBC B or B plus you will merely need to fit the Acorn ADFS Rom. The Winchesters are 100% compatible with the Acorn Winchester and Acorn ADFS and will also work with the Acorn Master 512 board with DOS plus.
Drive 1 Winchesters are also available for backup or just more storage and simply plug into the back of the Drive 0 unit.
The Winchester package consists of: Winchester unit (cased with controller boards, power supply and fan), Master reference Manual part 1, Winchester user guide and Winchester utilities on disk (such as formatter, verifier, ADFS menu and sophisticated backup program allowing you to make fast backups on DFS disks, ADFS disks or Drive 1 Winchester).

Stock Code	Description	Price inc. VAT
Drive 0 Single		
SP0150	VB20 20Meg Viglen Winchester	£499.00
SP0152	VB28 28Meg Viglen Winchester	£519.00
V155	VB40 40Meg Viglen Winchester	£799.00
V156	VB56 56Meg Viglen Winchester	£899.00
Drive 1 Second Drive		
SP0160	VB120 20Meg Drive 1 Winchester	£479.00
SP0162	VB128 28Meg Drive 1 Winchester	£499.00
V165	VB140 40Meg Drive 1 Winchester	£739.00
V167	VB156 56Meg Drive 1 Winchester	£769.00
V157	20MB Tape Streamer Backup	£689.00
V503	Acorn ADFS Rom and Manual (Only necessary for BBC B or B Plus)	£29.95

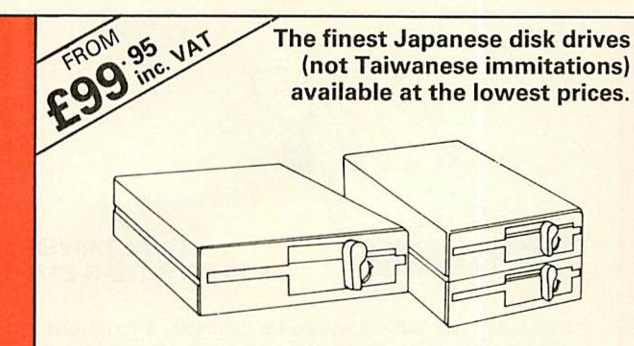
Please add £8 for insured courier delivery.

Available for use with SJ research file server at no extra cost, please specify when ordering.

DISK DRIVES

FROM £99.95 inc. VAT

The finest Japanese disk drives (not Taiwanese immitations) available at the lowest prices.

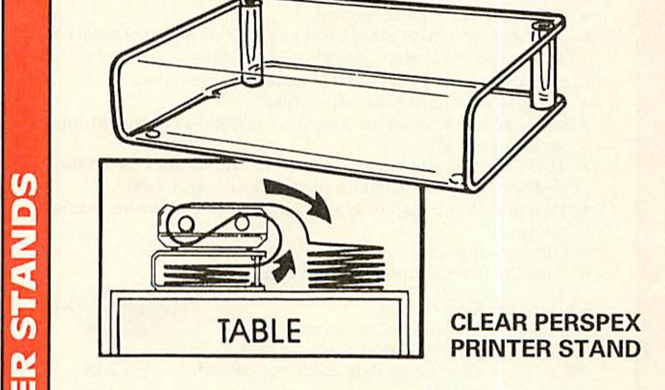


All disc drives are supplied with a manual, packed utilities disc and a full 12 Months warranty (2 Year Warranty available) and are ready to plug in and use on a BBc B (fitted with a DFS) B + or Master micro. 40/48 Track drives have a switch which enables operation in either 40 or 80 track mode.
The capacity quoted are given in single density mode; for double density mode (1770 DFS + ADFS as in the Master) the capacities should be approximately doubled.
An integral power supply is not necessary as the disc drives run from the micro's power source however should you require drives with their own power supply, these are also available.
If your BBC B micro does not have a DFS fitted then you will also require the Acorn dfs kit. These are available from Viglen.

Stock Code	Description	Price inc. VAT
SP014	400K Single Drive 40/80T	£99.95
SP030	400K Single Drive 40/80T + PSU	£109.95
SP019	800K Dual Drive 40/80T	£189.95
SP020	800K Dual Drive 40/80T + PSU	£209.95
VPD0240	100K Single Drive	£105.95
VPD0241	400K Single Drive 40/80T	£113.00
VPD0242	200K Dual Drive	£195.95
VPD0243	800K Dual Drive 40/80T	£219.00
VPD0245	100K Single Drive + PSU	£119.95
VPD0246	400K Single Drive + PSU	£135.00
VPD0247	200K Dual Drive + PSU	£209.95
VPD0248	800K Dual Drive 40/80T + PSU	£235.00
VPD0249	800K Dual Drive 40/80T + PSU in Metal Bridge Unit	£265.00
V0060	3.5" 400K Single Drive	£95.95
V0061	3.5" 800K Dual Drive	£199.95
V0062	3.5" 400K Single Drive + PSU	£135.00
V0063	3.5" 800K Dual Drive + PSU	£199.00
V0064	3.5" and 5.25" 800K Dual Drive	£219.00
V0065	3.5" and 5.25" 800K Dual Drive with PSU	£249.00

Please add £8.00 for insured courier delivery.

PRINTER STANDS



CLEAR PERSPEX PRINTER STAND

The Viglen printer stands are beautifully finished in clear perspex and raise the printer high enough to put continuous stationary underneath.

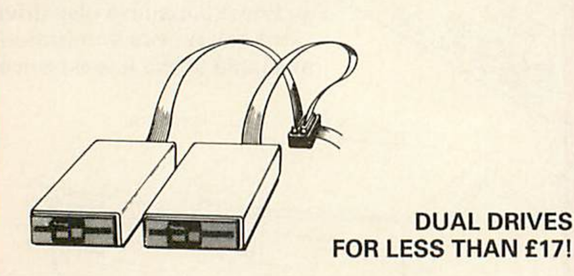
Stock Code	Description	Price inc. VAT
V490	80 Column Printer Stand (15" × 13" × 3.5")	£19.95
V491	136 Column Printer Stand (23.5" × 13" × 3.5")	£29.95

Please add £3 P & P

ORDER FORM ON LAST PAGE OF VIGLEN SECTION

SPECIAL OFFERS FROM VIGLEN

DUCKS



DUAL DRIVES FOR LESS THAN £17!

The Viglen Data DUCK (Dualling Up Connector Kit) converts any two single drives to a dual drive instantly. Simply plug the duck into the micro's disk drive socket and plug two single drives (any type and any make) into the duck to obtain a dual drive system accessed as drive 0 (and 2 if double sided) and drive 1 (and 3 if double sided). If neither single drive has its own power supply then you will require a Viglen power DUCK in order to obtain two disk drive power sockets from the micro.

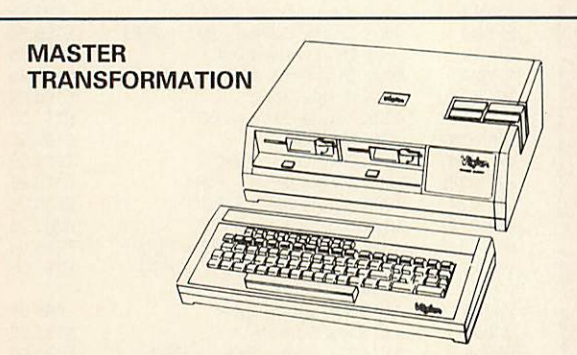
★ No soldering simply plugs in.
★ No need to take disk drives apart to change links.

Stock Code	Description	Price inc. VAT
V084	Viglen data duck	£16.95
V085	Viglen power duck	£7.95

Please add £2.50 for P & P.

CONSOLE SYSTEM

MASTER TRANSFORMATION



Give your BBC Master micro the professional PC look by replacing your existing lid with this smartly styled package. The system is strong and constructed in high impact ABS colour matched to the BBC Master and it gives your Master a very neat and impressive look.

★ Will support monitors including up to 16" TV.
★ Can house two 5¼" disk or Winchester drives.
★ Capable of housing 3½" drives.
★ Will accept Acorn cartridges and the Viglen Master Cartridge system.
★ Full internal metal screening.
★ Also available with fitted drives (5¼", 3½" or Winchester) or as a complete system including the Master.

The Master console unit system packages includes:

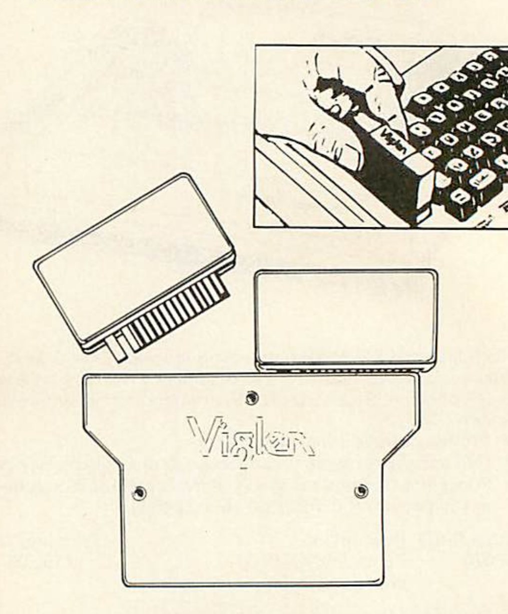
★ Remote Keyboard case with cable.
★ Metal screened main unit casing (including internal fittings for 5¼" drives).
★ Two switches which can be used for 40/80 track switching and can be either fitted on the front or rear of unit.
★ Two blanking plates to blank out any drive aperture that is not used.
★ Full labelling kit.
★ Fully illustrated fitting instructions.

Stock Code	Description	Price inc. VAT
V861	Viglen Master Console unit	£59.95
Accessories for the Master Console unit		
V853	Dual Drive data cable for console unit	£9.95
V854	Dual Drive power cable for console unit	£7.95
V855	Power supply for the console unit	£34.95
V866	Fan Kit for console unit	£34.95
V858	Fitting bracket for 3½" drive	£8.95
V851	Viglen Professional Console Unit for the BBC micro	£49.95
	Fitting service available from	£15.00

Please add £8 for insured courier delivery.

CARTRIDGE SYSTEM

VIGLEN ROM CARTRIDGE SYSTEM



Having fitted the Viglen Rom cartridge system to your BBC, Master or Master COMPACT, you can plug in your Roms/ Eproms simply by inserting each one in a Viglen cartridge and plugging in whichever cartridge you want to use. The same Viglen cartridge can be used on all the micros mentioned and there is no need to switch the micro on and off between cartridge changes.

The Viglen cartridge system for the BBC micro consists of the cartridge cable assembly and socket, blanking off plates, 1 cartridge and cartridge storage rack. The cartridge socket when fitted protrudes from the rectangular slot on the left of the keyboard where the cartridges are subsequently inserted. It is simple to fit and requires no soldering.

The Viglen cartridge system for the Master and Master COMPACT simply plugs into your Master cartridge slot (or COMPACT expansion port) and accepts two Viglen cartridges. On the Master you can plug in up to two Viglen cartridge systems thus giving you access to 4 Viglen Cartridges simultaneously. The system comes complete with 2 cartridges and cartridge storage rack. On the Master you can also use Viglen cartridges which have 32 and 64K paged Roms inserted.

Stock Code	Description	Price inc. VAT
V560	Viglen Rom cartridge system for BBC	£12.95
V559	Viglen Rom cartridge system for BBC (low profile)	£12.95
V550	Viglen Rom cartridge system for Master	£14.95
V551	Viglen Rom cartridge system for COMPACT	£14.95
V561	Single Viglen cartridge	£3.45

Please add £2.50 P & P (£00.50 for single cartridge).

LOOK FOR OUR AMAZING SPECIAL OFFERS

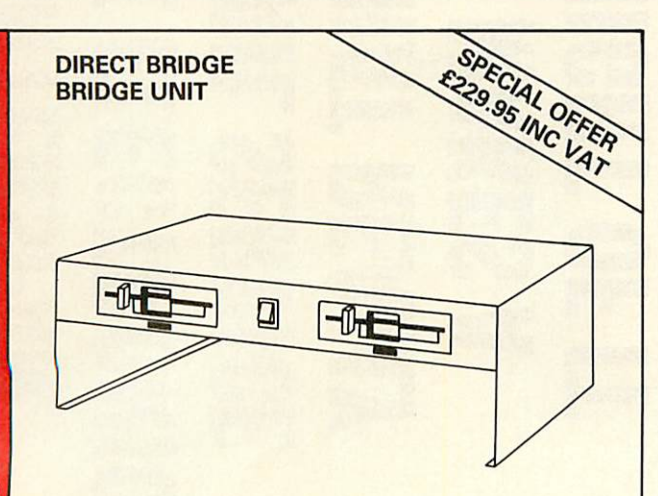


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SPECIAL OFFERS FROM VIGLEN

DISK DRIVES

DIRECT BRIDGE
BRIDGE UNIT



★ FRONT PANEL SWITCHING
★ 800K DUAL DRIVES 40/80T WITH PSU

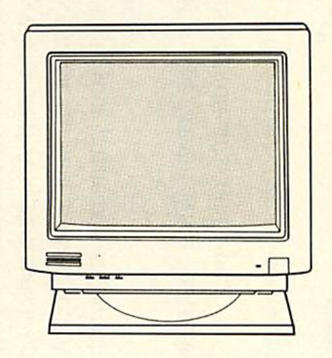
Direct disk drives are manufactured to the highest standard using high quality Japanese mechanisms. All drives are supplied complete with user manual and utility diskette.

Stock Code	Description	R.R.P.
SP0249	800K Drive in Bridge Unit with PSU	£229.95

Please add £8.00 for insured courier delivery.

COLOUR MONITOR

★ A VERY SPECIAL OFFER ★



A High Resolution Colour Multiscan Monitor for only £343.85 inc VAT.

Just look at the following features:

★ Can run modes 18–20 on the Archimedes
★ Compatible with Archimedes, Master and BBC Model B
★ Manufactured in Japan by Fujitsu
★ 14" High Resolution Non Glare screen .31mm dot pitch
★ input signals TTL/Analogue, RGBI RGB rgb, RGB analog
★ Swivel base included
★ Maximum Resolution 800×560 dots
★ Scanning Frequencies: 15–17Khz, 21–52Khz, 29–34Khz
★ Also 100% Compatible with IBM PC/AT CGA/EGA/PGA/VGA.

Stock Code	Description	Price inc. VAT
VA079	Fujitsu General ME–503 Colour Monitor	£343.85

Please state cable required for Archimedes, Master or BBC B.

Please add £8.00 for insured Courier Delivery.



Viglen Ltd.,
Unit 7
Trumpers Way
Hanwell, London W7 2QA
Telephone: 01-843 9903
Telex: 919 304 VIGLEN G
Fax: 01-574 5126



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Simply fill in the coupon or write to us with your requirements enclosing a cheque/postal order or your credit card no. for the total amount. Don't forget to add the cost of delivery. Allow 7 to 10 days for delivery.
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Showroom opening hours
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* Tick one please.

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Name ______

Address ______

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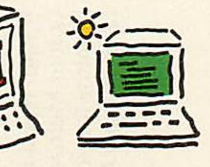
INTERSPAN, THE ELECTRONIC MAIL SERVICE THAT REALLY MAKES A NIGHT OF IT

Have you ever dreamed of an electronic mail system which doesn't cost a fortune to run, which runs totally automatically, and which integrates with your local network, allowing mail to be sent from any station or to any user? One which allows the system manager to vet and authorise mail before it is sent? A system which uses your existing hardware,* but not when you want to use it too? A service which doesn't add a penny to your 'phone bills and which can be totally budgeted in advance?

Do you think this is just a pipe dream? While you're dreaming, Interspan could be making your dreams come true.

*BBC microcomputer, Master or Compact with Disc or Network, and DTI or Communitel Modem.









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HINTS & TIPS

DRAWING THE LINE

Invaluable advice on printing music staves, emulating the Lotus 123 menu, compressing mode 7 screens, and more besides

David Atherton

£5

MUSIC RULES

Terry Blunt from Crowthorne has sent an excellent little program for musicians who find manuscript paper prohibitively expensive. The program will print out a sheet of manuscript paper containing 12 staves on a standard sheet of printer paper. Terry says that the program will work with any Epson-compatible printer, but as it simply uses the underline symbol to do its work, it will probably work with non-Epson compatibles as well.

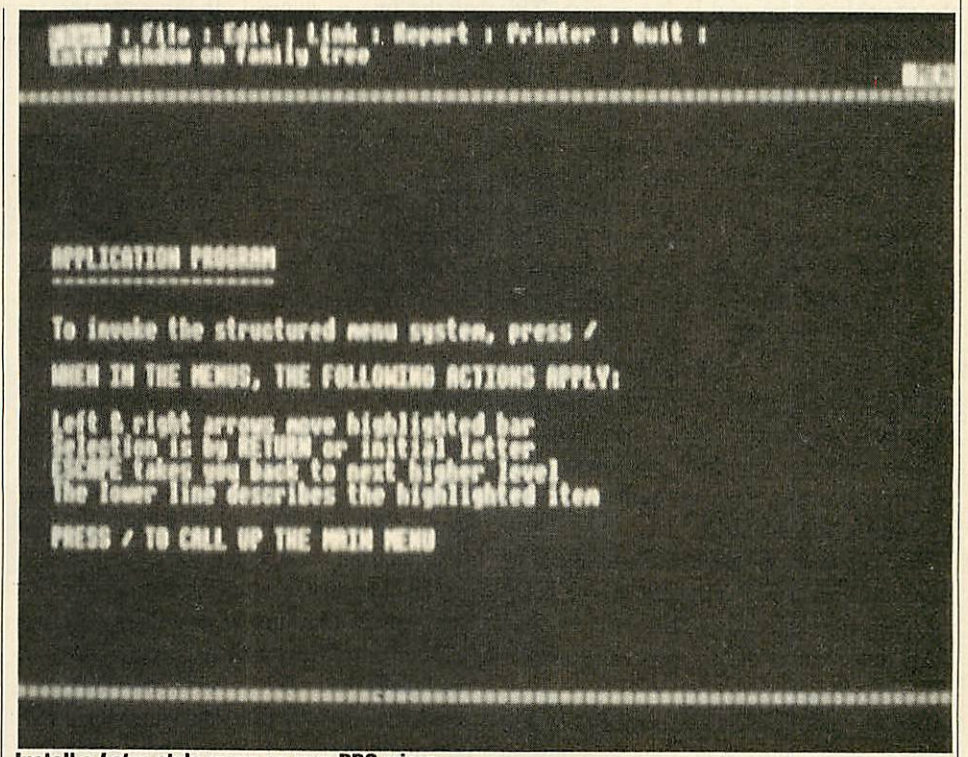
The program contains three FOR... NEXT loops which control the printing, and another to control the space between staves. The inner loop prints each line by outputting 80 underline characters (ASCII 95). The next loop repeats this four times to give a five-line stave, and the outer loop prints 12 staves encompassing a separate loop which feeds the paper with the VDU 10 command (linefeed).

You might like to experiment with values to produce pairs of staves for treble and bass clefs. To do this you could introduce another loop, or make the spacing loop decide whether long or short spacing is required. This can be done by testing whether the outer control variable is odd or even; the simplest way is to test if 'stave DIV 2' and 'stave/2' are equal.

£5

LOTUS MENUS

Many readers who use PCs as well as their BBC micros may have used *Lotus 123*, the industry standard spreadsheet, and liked its detailed but unobtrusive menu structure. If you'd like menus like this in your programs, then a skeleton program from Graham Crow of Monmouth is just what you need. Graham's program is an outline which allows you to use this menu style in your own programs. The*Lotus* menu works by listing the options as single words on the top line or two of the screen. Items are selected by moving the cursor keys from left to right, or pressing the initial letter. A more detailed line of text appears underneath the menu, and pressing Return confirms your choice. Program activity or another menu, working in the same way, is the result.



Install a *Lotus*-style menu on your BBC micro

Pressing the Exit option takes you back up a level through the menu. This system supplies all the information you are ever likely to need, in a simple-to-use and extremely compact format, which doesn't disturb your screen display.

This is how it works. The procedure PROCinit is used to declare the maximum number of menu items (in M%) and the STRING$ definitions to give the maximum length of each menu item, and the maximum length of the full text string. The PLACE% array is used to hold Tab positions but you don't need to work these out as the program does it for you. There is no need to alter any of these settings. The main routine, FNmenu, is called every time you want a menu printed. It returns with the user's selection. The procedure prints all menu items, highlighting and showing the full description of the first item. All the necessary Tab positions and so on are calculated. The function returns a number giving the item selected. The menu item on the far left of the screen is 1, the next is 2 and so on. If Escape was pressed to exit, the variable escape% is set to TRUE.

Before you call the menu function, you must fill two arrays and set a variable. The arrays MENU$ and SUB$ should be matched to the short and long descriptions of the item respectively, and the variable N% set to the number of items for this menu. This is done in the example program in the procedure PROCmainmenu, where one of the actions is coded for a further

menu. All you need to do to add your menus to the program is alter the text in the data statements in PROCmainmenu, and if appropriate, the value of N%, and then change the actions taken at the end of this procedure.

£5

UPPER TO LOWER CASE

Programs are so much more legible if all the variable are printed in lower case. This also helps to avoid the misuse of any keywords, the reason we always use lower case variables in *Acorn User* programs. But what if you have written or inherited a program that contains many upper case variables? This is particularly relevant if you are converting a program to BBC Basic from another Basic, perhaps originating on another machine and transferred as a text file to the BBC.

Roger Stark of Cambridge has written a program which converts all the upper case variables, procedure names and function names within a program to lower case, without affecting text in quotes, DATA statements and REMs.

The program is itself a Basic program and works by being appended to the program which needs conversion. It is 15 lines long, and should be entered as listed. To convert a program you should first save a copy of the converter program in the normal way, and then save a copy as ASCII. This is done by typing

```
*SPOOL CONVASC
LIST
*SPOOL
```

Next you should LOAD the target program, ensuring that the lowest numbered line is 20. You may have to renumber the program to do this, or remove a REM or two. With the target program still in memory, type *EXEC CONVASC. The program is now ready, and you should type RUN. When the program is finished, the extra lines which performed the conversion are not required and can be deleted with DELETE 1, 15. The program can now be renumbered again if necessary or REMs can be re-entered, and the program is ready to be saved. If it worked before, it will still work, but obviously any new lines referring to the variables must now conform to the lower case in use.

The program works by looking through the memory for upper case characters, and converting them to lower case while avoiding certain areas. Most of the code is taken up by working out what to avoid. The program runs a loop from PAGE to LOMEM, reading each byte in turn. After reading the byte, the next line is used to print, and skip over the first (and subsequent) line numbers. Then the program checks for the following exceptions.

If quote marks are found, no changes are made until further quote marks or the end of a line is found. If a DATA (&DC) or REM (&F4) Basic token is found, the rest of the line is skipped. If the code for an embedded line number (one following a GOSUB, GOTO or ELSE) is found, the number is skipped.

Finding an ampersand the program assumes that a hex number will follow. This must remain in upper case, so the program moves on to the next non-alphanumeric character. At this point the program does something positive. If the character is upper case, and it is *not* an isolated character followed by a % symbol, then it is converted to lower case.

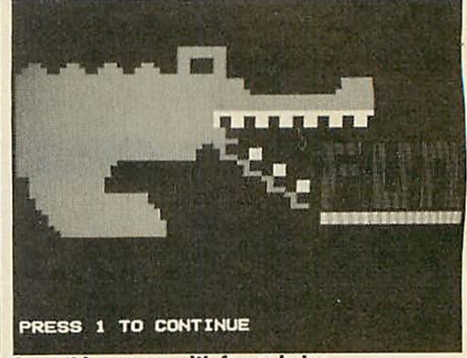
However this doesn't convert the last character of an integer variable, and a separate step is required for this. These two steps avoid the conversion of the variables A% to Z%.

The way Basic works when you enter lines means that any keywords recognised are converted into tokens, single bytes in the range 128-255, which are then expanded back into full text when the LIST command is used. Line numbers are coded in a special way, but everything else is stored as normal ASCII text. This means that the converter program has a side-effect of converting any Basic keyword which has been entered incorrectly, and therefore unrecognised by the Basic interpreter, as the machine will be storing it as full text, rather than the token.

There are two exceptions which Roger's program does not cater for. Assembly language code used within square brackets is not tokenised (other than the word AND, and the first two letters of ORA), and so will get converted to lower case, which is not usually required. This can quite easily be solved by adding an additional line to the program, but I'll let you work out how to do that. The second is the use of EVAL statements. If the statements FRED=5 : a$="FRED" : PRINT EVAL (a$) are issued, the value 5 will be printed. The program as it stands will convert the first occurence of FRED but not the second, which causes an incorrect result. There is no easy solution to this, and you'll just have to check EVAL statements in your program before you convert it.

£5

MODE 7 SCREEN COMPRESSION



Save this screen with fewer bytes

V J Spanner of Seaford, East Sussex, is concerned about the amount of space taken up by mode 7 screens when many of them are stored; say in a database application, or perhaps downloaded from or Prestel. He has provided a program which compresses the screens, saving up to 400 bytes or 25 per cent on each one. To use the compression program you must have already saved your screens to disc. The standard screen save option in the ATS and most Prestel terminals, and teletext editing programs will be the correct format. Note that some editors, particularly the Communitel viewdata system save in a slightly different format, and if you're using these you'll need to alter the FFFF7C00 address in the load command to FFFF7B98.

When run, the compression program asks for the filename of your screen on disc, and a filename for the compressed screen, which obviously must be different. It then loads the original screen in, and processes it. This takes about 20 seconds, and then a message tells you the number of bytes saved. To redisplay a compressed screen, the decompression program is used. All that is required this time is the filename, and the screen is restored as it was. A facility hasn't been built in to resave the screen in an uncompressed form.

The program works by using a popular compression system known as run-length encoding. It works by counting the number of times each byte occurs in sequence, so the string 'AAAAA' (five bytes), is replaced by the code for 'A' followed by a five (two bytes). If every byte of the screen was different, for example if it were solid

text, then the 'compression' would actually produce a file twice as long as the original, with every byte recorded, followed by a '1' marking a single occurrence. In practice, even text-based screens have plenty of spaces together on them, so the results are rarely this bad. The real savings come, however, when there are vertical graphics lines on the screen, or even better, half-empty screens with dozens of consecutive space characters. As only one byte is used to store the frequency, only 255 consecutive occurrences can be recorded in a double-byte combination. Any more than this are treated as a separate set. Nevertheless you can see how a completely empty screen can be saved as eight bytes, so in certain circumstances the technique can be very powerful.

The program was designed to work with teletext screens. There is absolutely no reason, however, why you should not use the same idea with screens in other modes, although it has to be said, this will not be a fast process. The only modifications required to the programs are to change the start address (and the MODE statements, obviously). Modes 4 and 5 start at &5800 (&57FF in the decompressor), and modes 0,1 and 2 start at &3000 (&2FFF).

As it stands the program compresses to and reloads from a disc file. But it would be quite practical to load to and from memory, by altering the BGET and BPUT statements to set a memory byte and increment a counter. The case converter program above shows you how to write to and read from successive memory bytes.

£5

DATESTAMP YOUR BASIC PROGRAMS

If you've ever forgotten which version of your masterpiece is latest one, and added a large chunk of code to an obsolete version, then you'll be pleased to receive this useful utility from Geoff Davis of Lydney. It automatically adds the date and time to your program. The program is designed to run on the Master 128, but will also work on other BBC micros which have a real-time clock fitted which supports the Osword 14 call to read the date and time. The Solidisk RTC and *Genie* Watch add-ons do this, but not Econet, which uses a different call to read the clock.

The program in the yellow pages generates a machine code file called STAMP which when run (with *STAMP or *RUN STAMP) will add a line 0 to your program which contains a REM statement followed by the date and time. If you keep the STAMP file on your current development disc, and run it just before you save a file, then you'll always know where you're up to. If you're using ADFS, then the STAMP file should be placed in the library directory. Running the program on a previously stamped file simply replaces the old date and time with a new one. Any existing line 0 will be deleted.

The program works by reading the date and time using the system call 14, which returns a string in the format 'Sat, 02 Apr 1988.15:23.00'. The call requires that a buffer be specified into which to copy the information in text form. The buffer is placed immediately after a fixed string



```
>*STAMP
>LIST
    0 REM Thu,14 Apr 1988.20:26:27
   10 REM Program Datestamper
   20 REM by G K Davis
   30 REM for M/B/B+/E/C with RTC
   40 REM (c) Acorn User June 1988
   50 :
   60 PROCclearmem
   70 PROCassemble
   80 PROCchecksum
   90 PROCsavecode
  100 END
  110 :
  120 DEF PROCclearmem
  130 FOR I%=&A00 TO &A2F
  140 ?I%=0
  150 NEXT I%
  160 ENDPROC
  170 :
  180 DEF PROCassemble
  190 code%=&A00
  200 FOR pass=0 TO 3 STEP 3
  210 P%=code%
  220 [OPT pass
```

Date and time in line 0

'0REM' and then the entire string is read, byte by byte, and placed into the keyboard buffer with the Osbyte 138 call. This is a standard call which mimics keypresses.

The program then ends, and the bytes in the keyboard buffer are 'typed' out as though you had entered the line yourself. The carriage return that is required at the end of the line is supplied as part of the Osword 14 call, and so does not need to be entered separately.

£5

IGNORANCE IS BLISS

The Master 128 operating system has slightly improved printer control software, including a NOIGNORE facility, whereby all 256 characters can be sent to the printer. Robin Burton of Groby has been looking at this, and has come up with a routine which replaces the BBC and Master's character ignore facility. As well as providing the BBC with the Master's specification, Robin's routine also allows you to override the ignore settings of both machines. This could be used to standardise a number of machines for use with one printer, or with perhaps one software package which doesn't correctly interpret the IGNORE character. This is particularly so on the Master 128, where when a NOIGNORE setting is in use, the standard Osbyte call (&F6) which reads the IGNORE character will still return the last ignored character. This is because NOIGNORE is a separate flag, which overrides but does not cancel the IGNORE setting. Many software packages for the BBC read the ignore character, but don't check if a NOIGNORE overrides this. Programs need to directly read to IGNORE setting as the ignored character is actually sent to the printer (ie, not ignored) when characters are preceded with VDU 1.

The routine is supplied as a listing which generates a machine code file IGNSWCH, which can be run with *IGNSWCH. The action of the program depends on the flag set after the variable 'ignflag'. If the flag is zero (as listed), then there is no ignore character and all bytes output are sent to the printer. If the flag is set to 1, then the ignore character on the micro itself is used, effectively cancelling the routine.

A setting of 2 is primarily for Master users, and causes the IGNORE character to be used, ie as normal, even when a NOIGNORE setting is active. In other words it disregards the Master's NOIGNORE override. The flag can be set at assembly time, or altered later by directly poking the flag byte, which is identified during assembly.

QUICK TIPS

To test a program that uses a printer, but without the printer, try *FX5,0. This sets a 'printer sink' – all characters sent to the printer will be ignored.

If your printer is not set for auto-line feed and everything you print is on one line, you can try *FX 6,0. This makes the computer send out an extra line feed at the end of every line.

You can use *FX 3,10 instead of VDU 2 in your programs to switch on the printer. *FX 3,0 switches it off again.

Contributions to the Hints & Tips column are most welcome. Submissions are preferred on paper and disc (which will be returned), and should be sent to David Atherton, Hints & Tips, *Acorn User*, 20-26 Brunswick Place, London N1 6DJ.

ARC AGORA

ANIMATED ACTIVITY

The sprites and graphics of the Arc make it ideal for computer animation

Dave Acton

We kick off this month with a little bit of animation. The first offering comes from an *Acorn User* regular Dave Lawrence, and tackles the problem of 'in-betweening' – taking two pictures and working out an animated sequence to join them together.

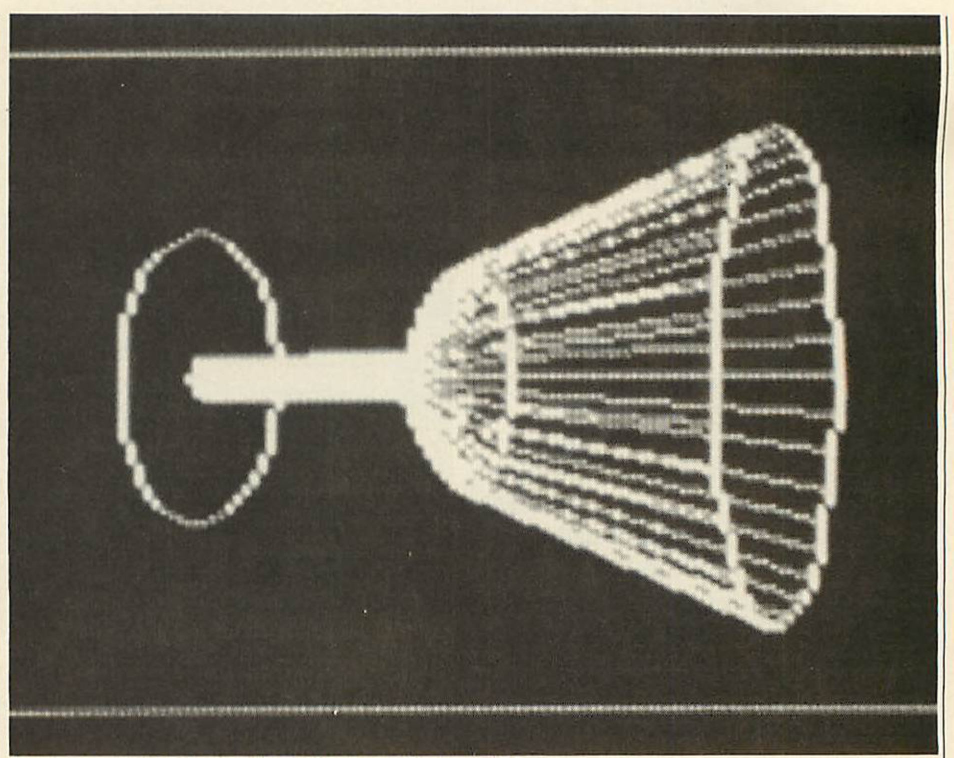
The program, listing 1 on the yellow pages, is quite simple. The mouse pointer is enabled and PROCinput is called to request a set of lines. To draw a line, move the pointer to the start position and press the Select (left) mouse button. Subsequent lines can be added by pressing Select again. If you do not want the next line to follow on from the end of the last, move the pointer to the new start position, and press the Menu (middle) button.

Once you have entered your first set of lines, press the Adjust (right) button. PROCinput is called again to request the destination set of lines. Enter these in the same way as the first set – they are shown in a different colour. You have to enter the same number of points as the first time.

PROCinput uses a new facility of Basic 5. The start positions are held in the array start(), and this array is passed to PROCinput as a parameter. In the definition of PROCinput, the first parameter is defined as RETURN a(). This takes an array in, refers to it locally as a(), and then returns the new values of the array elements to the original array – start().

So that the animation is smooth, a 'double-screen' process is used. In other words, two banks of screen memory are utilised – the non-displayed one is changed. Once the new image has been drawn, the banks are swapped over so that the next image can be plotted invisibly.

The Osbyte calls 112 and 113 have been extended to make 'double-screening' easier. Osbyte 112 sets the screen that is to be written to; Osbyte 113 sets the screen to be displayed. In each case, the parameter after the Osbyte number is the screen bank number, 1 or 2. In listing 1, bank% contains the screen to be updated, and this value alternates between 1 and 2.



The Arc's speed animates the goblet's motion smoothly

Sufficient space for the two screens should be configured beforehand. Users with 300 series machines should configure ScreenSize to at least 10 and those with 400 series machines might as well configure ScreenSize to 0 as their machines will allocate sufficient memory by default.

Finer control over the displayed portion of screen can be achieved by using an Osword call – Osword 22 to be exact. This call takes an offset to the start of screen memory. This offset must be placed in a control block. A procedure to change the start of screen address could be something like this:

```
1000 DEF PROCstart(address%)
1010 ?block%=3
1020 block%!1=address%
1030 SYS "OS_Word",22,block%
1040 ENDPROC
```

The first byte of the parameter block contains a 'type' byte. Bit 0 of this byte should be set if the new address is to be used by the VDU drivers. Bit 1 is set if the new address is to be used when displaying the screen. So a value of 3 updates both. These two bits correspond to the two Osbyte calls described above.

SPRITELY SPRITES

Using multiple screens is a good way of animating objects or smoothing graphics operations. But each screen does take up a lot of memory, so to provide a more flexible means of animating smaller areas a different approach must be taken.

The sprite system of the Archimedes is perhaps the most impressive part of the Arthur operating system, and by using sprites, the user can achieve some impressive animation using little memory.

Listing 2 illustrates how this method

may be employed. Before trying the program out, ensure that you have sufficient memory allocated to sprites by typing:

*CONFIGURE SpriteSize 23

and pressing CTRL-Break. This will allocate 23x8k or 184k to the sprite system. 400-series owners need only configure SpriteSize to 6 since memory is allocated in 32k rather than 8k chunks.

Listing 2 rotates a wire-frame image in stages, storing a sprite for each stage of animation. The points of the image are stored in the array p() and the vectors that form the sides of the image are stored in v(). As this is an illustration of animation rather than co-ordinate geometry, the method of plotting the object in perspective is left to you to fathom out!

The Basic 5 feature of passing arrays to and from procedures is again employed, as is the array operand '.' which performs true array multiplication. Sadly, although it is a joy to have some matrix operations available in Basic, they haven't been fully implemented, which has made it necessary to use the temporary array temp() to carry out some array calculations. In particular, the program has to apply a matrix transformation to an array of points. However, Basic 5 can only apply such a matrix to a single vector – and not a vector which is an element of a larger array.

The standard command for 'grabbing' a sprite from the screen is *SGET. However, a useful extension exists in the form of VDU 23, 27 which can be used to select and grab sprites with 'names' of 0, 1, 2 and so on. Not only does this make it easier to use a series of sprites, but VDU 23, 27 is considerably faster than its *SGET and *SCHOOSE counterparts.

The procedure PROCperspective is used to draw the lines that form the image and PROCrotatex is called to transform each point within the image. The individual frames are 'grabbed' by moving to the bottom left-hand and top right-hand corners of the animated area before issuing a VDU 23, 27, 1, n command. This stores the bounded area as sprite 'n'. VDU 23, 27, 0, n is used to recall the sprites. Note that sprite plotting is so fast that the Archimedes can easily plot 50 sprites per second – one per display field. The whole operation is made smoother by preceding the command that plots the sprite with a WAIT – the equivalent of *FX19 on the earlier BBC micro.



Dave Lawrence's 'in-betweening'



Instant screendumps

£20

EVENTFUL PRINTING

Our first relocatable module comes from Ian Macfarlane of North Humberside, who receives £20 for his efforts. Having seen the Print key in use on the PC emulator, Ian thought it would be useful to set up the key so that it could be used to provide a more general screen dump facility.

However, as Ian notes, the screen dump commands *HARDCOPY FX, *HARDCOPY MX and *HARDCOPY RX take a very long time to complete and require interrupts enabled. So they cannot be called from within an event routine – which would be the easiest way of detecting the Print key has been pressed.

Ian's clever solution makes use of the operating system routine OS_CallBack. The idea is that the depression of Print key is detected within an event routine, and once control has passed out of that routine, the screen dump command is issued.

Ian's program assembles a piece of machine code which is saved automatically as 'SPCODE'. This code is a module, and so will respond to all of the standard module commands. A single star command is supported by the module – *PRINTINIT – and this command is issued automatically if the code is installed with *SPCODE.

Sadly, limited space means that we cannot carry the full version of Ian's program, which included a means of selecting which type of screen dump was required. However, the core program is included as listing 3 on the yellow pages. The full version is on the 3.5-inch version of the monthly disc – see page 19 for details.

The first part of Ian's program is the module header. This is standard to all modules, and could be the starting point for writing your own.

After running the module or issuing *PRINTINIT, the routine 'printinit' claims the event vector using the call OS_Claim, and appends – 'keyevent' to the 'chain' of event routines. The 'key pressed' event is then enabled.

The subroutine 'keyevent' first checks to see if the event is of the correct type and, if so, that the key pressed was 'Print'. If so, register 14 is preserved (because we are about to issue a SWI) and OS_CallBack is invoked to ensure that the screen dump command is issued at a more appropriate time. OS_CallBack takes two parameters – in R0 the address of a block of memory where the registers may be saved; and in R1 the address of the routine to call later, in this case, 'callbackhandler'.

So, the event routine is left promptly and then, just before control is returned back down to the user level, 'callbackhandler' is called. This routine simply preserves R14, issues the command at 'hardcopystring' and returns. The sequence of commands following the SWI "OS_CLI" is crucial if control is to be returned successfully to the user level. Those of you who have copies of the *Programmer's Reference Manual* might like to refer to page 340 in part 1.

The string stored at 'hardcopystring' could be changed to 'SCREENSAVE PICTURE' for example. In this case, pressing the Print key would cause the screen to be saved on disc as 'PICTURE'. A useful extension to this might be to alter the filename used each time so that different 'snapshots' are stored.

Details of the listings are on page 81. All submissions – hints, tips, programs or simply ideas – should be sent to Archimedes Agora, Acorn User, *Redwood Publishing, 20-26 Brunswick Place, London N1 6DJ.*

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STEP BY STEP

GET INTO THE CHARTS

Line graphs, bar charts and pie charts are effective ways of displaying data: here's how to use *InterChart* to draw by numbers

Bruce Smith

They say a picture's worth a thousand words and certainly when it comes to representing data or trying to analyse sets of figures, comparing two graphs is much easier than relating columns of numbers. To that end Computer Concepts' *InterChart* is one of the best of a surprisingly limited range of graphic display software which is available for the Acorn micros.

The data *InterChart* uses to produce graphs can come from just about any source, though taking it directly from a package other than one of the *Inter* family is difficult: it first has to be massaged into a format which *InterChart* understands to enable it to be used. The manual explains the details of the format. This Step by Step will show how to display two sets of data – in this case money in and money out or, income and expenditure. The data could be from the office, home or school accounts, or even the ones the tax man is unaware of! We'll take the data month by month so there will be two sets of 12 figures.

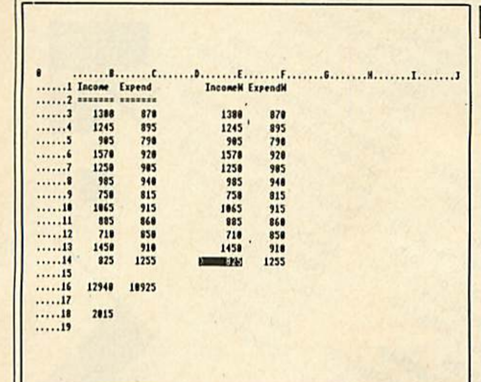
Month	Income (£)	Expenditure (£)
Jan	1300	870
Feb	1245	895
Mar	905	790
Apr	1570	905
May	1250	920
Jun	985	940
Jul	750	815
Aug	1065	915
Sep	885	860
Oct	710	850
Nov	1450	910
Dec	825	1255

Generating data

Of course the principles involved could be applied to any two sets of data. And once you master displaying two sets of data together then displaying three or more sets of data graphically is easy.

For our purposes the data to be displayed by *InterChart* can come from three sources: *InterSheet,* a Basic program's data file or another spreadsheet such as a *ViewSheet* link file. Importing data directly from *InterSheet* to *InterChart* is easy as the excellent ROM-Link software connects the two packs directly.

As always, plan first. The graph we wish to create will be a labelled graph which has months along the horizontal (X) axis and monetary amounts listed along the vertical (Y) axis.



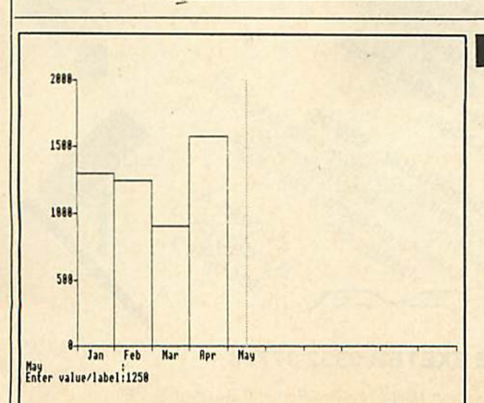
A	B	C	D	E	F	G	H	I	J
1	Income	Expend		IncomeW	ExpendW				
2	=======	=======							
3	1300	870		1300	870				
4	1245	895		1245	895				
5	905	790		905	790				
6	1570	920		1570	920				
7	1250	905		1250	905				
8	985	940		985	940				
9	750	815		750	815				
10	1065	915		1065	915				
11	885	860		885	860				
12	710	850		710	850				
13	1450	910		1450	910				
14	825	1255		[illegible]	1255				
15									
16	12940	10925							
17									
18	2015								
19									

Data from ViewSheet

The two sets of data must be generated to contain a label (the month) followed by a numeric amount (the value) which is to be plotted against it.

Importing data from *ViewSheet* is best done via a link file as this is a pure file in a format that can be readily manipulated. The dump (left) shows how a typical *ViewSheet* annual summary file might be constructed to write to a link file. The second set of figures (in the columns with the W suffix) contain the link file connection, and write to a file called 'VS10' previously created with CREATE 10 2 12.

Listing 1 on the yellow pages converts the link file into two equivalent *InterChart* format import files (Income and Expend). The program could easily be adapted to handle larger link files.



Direct entry

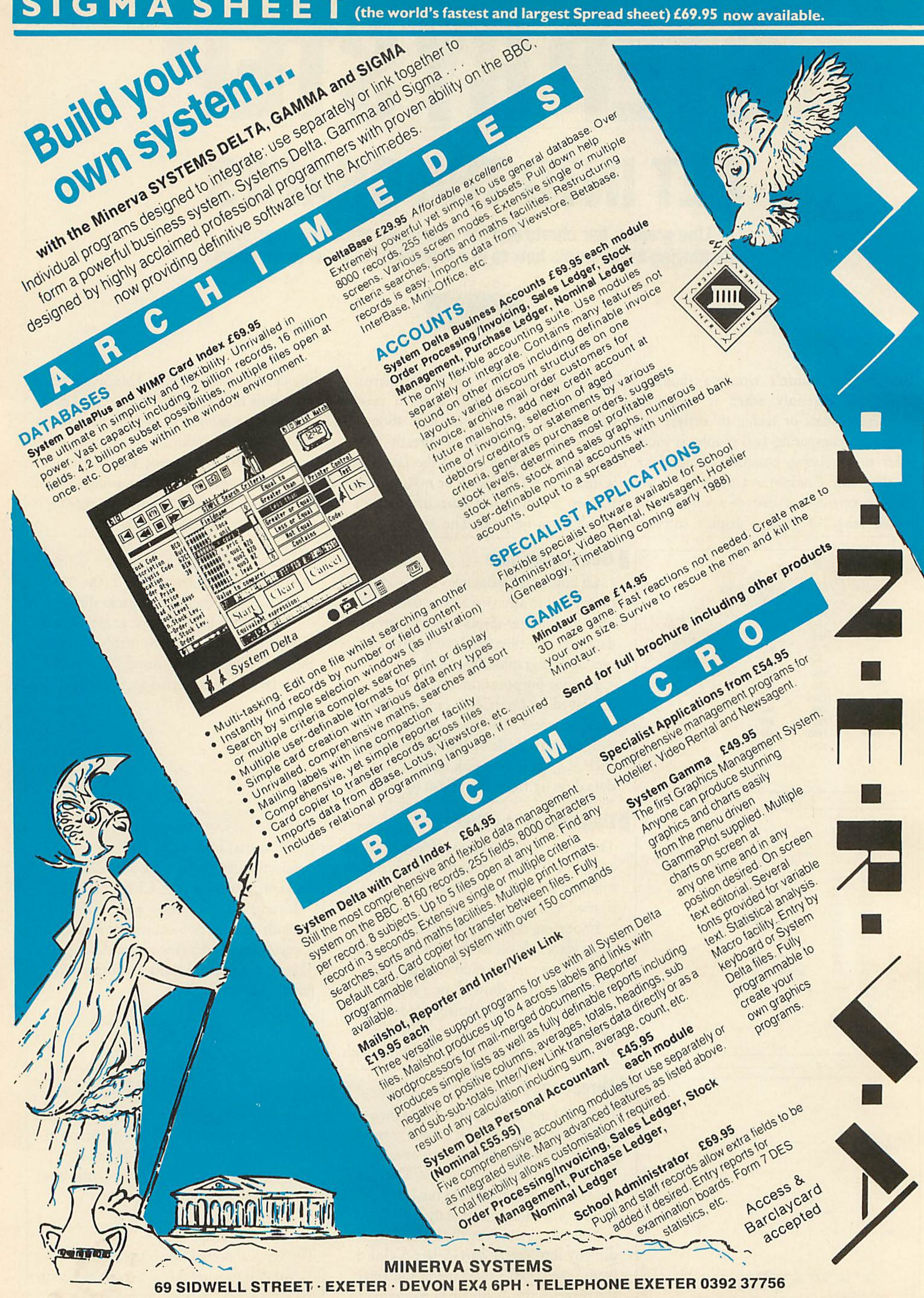
If you do not have a spreadsheet then listing 2 on pages 39 and 41 will create the import file by reading in a set of data consisting of labels and values. The data in the Basic program and the final format are identical to that generated by listing 1.

You can in fact type the information directly into *InterChart.* Select option 5 from *InterChart*'s main menu and enter the name of the graph when requested to do so: 'Income', for example. As the graph to be labelled, press L when prompted and return to the main menu. Press Escape to move into the editing window and then enter the value and label. Precede the label with a double quote mark first, ie:

"Jan <Return>

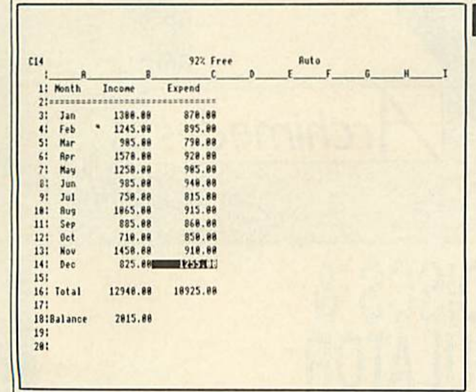
1250 <Return>

The vertical dotted line is the editing cursor and moving this along the axis with the cursor keys makes it possible to edit data by re-typing it.



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• Simple card creation with various data entry types
• Unrivalled, comprehensive maths, searches and sort
• Mailing labels with line compaction
• Comprehensive, yet simple reporter facility
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Send for full brochure including other products
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STEP BY STEP



C14		92% Free	Auto
	A	B	C
1:	Month	Income	Expend
2:	========	========	========
3:	Jan	1300.00	870.00
4:	Feb	1245.00	895.00
5:	Mar	985.00	790.00
6:	Apr	1570.00	920.00
7:	May	1250.00	985.00
8:	Jun	985.00	940.00
9:	Jul	750.00	815.00
10:	Aug	1065.00	915.00
11:	Sep	885.00	860.00
12:	Oct	710.00	850.00
13:	Nov	1450.00	910.00
14:	Dec	825.00	[illegible]
15:			
16:	Total	12940.00	10925.00
17:			
18:	Balance	2015.00	
19:			
20:			

ROM-Link and import

Using sets of *InterSheet* data is easy. As they are three columns of figures, their references should be noted, ie:

Labels A3-A14
Income B3-B14
Expend C3-C14

Once you have entered *InterChart* and set the graph name with option 5, this data can be directly imported using ROM-Link.

Dealing with the income data first, select 'Income' as the graph name for a labelled graph and then enter the following command from the main menu:

:IS.0: GETBOXES (A3:B14)

This will read in the data directly from *InterSheet*. Press Escape to view the graph.

```
INTER-CHART 0
(C) Computer Concepts 1985

1) Save all graphs
2) Load new graph
3) Save current graph
4) Load additional graphs
5) Select graph (EXPEND)
6) Set colours
7) Display graph
8) Delete graph
9) Import file

ESC Edit data
Please enter choice
:IS.0:GETBOXES(A3:A14)
```

More data

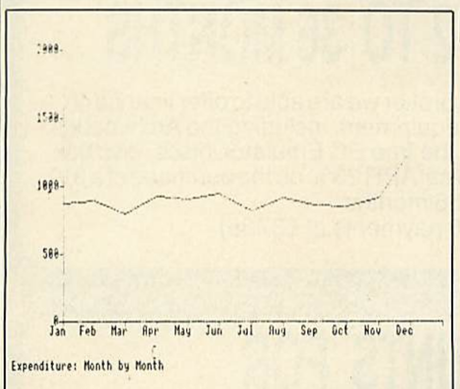
Importing the second set of data – expenditure – requires two import actions as the expenditure data is separated from the label data: the income column is in between. To do this select a new labelled graph (Expend) with option 5, Escape to Edit mode and set the auto step on to 'label' by pressing f6. Then from the main menu enter:

:IS.0:GETBOXES (A3:A14)

Press Escape to auto edit mode and set auto step on to 'value', re-position the cursor at the 'Jan' entry and enter following colon command from the main menu:

:IS.0:GETBOXES (C3:C14)

If you press Escape you will see that both have been entered.

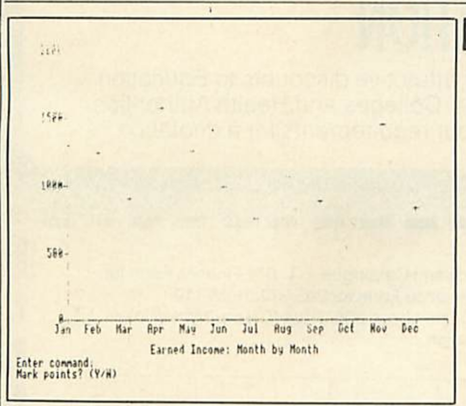


Displaying graphs

Data created with listings 1 or 2 must be imported using option 9 from the main menu – 'Import file'. As with all graphs, first select the name and type with option 5, and then enter the filename when requested. The data will be read from disc.

With both sets of data in position, the current graph is displayed by selecting 7 (Display Graph) from the menu.

By default this will display a line graph, but any values over 999 will be displayed exponentially on the Y-axis, which is not at all desirable. To alter this, press N followed by G (for General). As numbers will not go above 9999, select '4' when prompted for the number of figures. The vertical axis will be re-numbered accordingly.



Adding labels

Graphs may be annotated once displayed. To do this press f5 and using the cursor arrow keys position the cursor under the graph – enter a suitable title and press Return followed by Escape.

Do the same with the income graph, selecting it first with the main menu. Labels can be edited by moving the cursor on to the label in question and pressing the Copy key. The text will be moved back down on to the editing line.

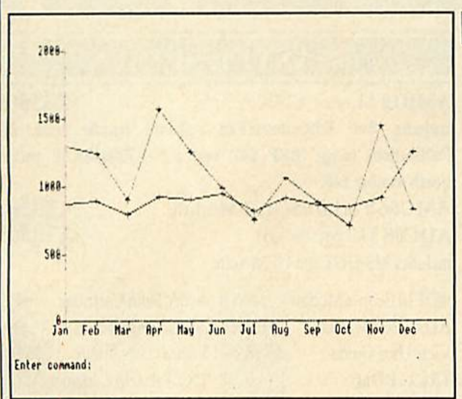
Line graphs may be altered so that the lines connecting points are not displayed. Press 'J' and answer the prompt accordingly. By pressing 'M', each point will be marked with a cross to make it more prominent (left).

```
10 REM Create Inter Chart Data File
20 REM by Bruce Smith
30 REM for BBC B/B+/M/C/A with IC
40 REM (c) Acorn User June 1988
50 :
60 MODE 3
70 file1$="Income"
80 file2$="Expend"
90 PRINT "IC Data Creation Utility"''
100 PRINT ''"Creating data files"
110 handle1%=OPENIN file1$
120 handle2%=OPENIN file2$
130 :
140 FOR loop=1 TO 12
150 READ label$,in,out
160 PROCwrite(handle1%,CHR$34+label$)
170 BPUT# handle1%,9
180 PROCwrite(handle1%,STR$(in))
190 BPUT# handle1%,13
200 :
210 PROCwrite(handle2%,CHR$34+label$)
220 BPUT# handle2%,9
230 PROCwrite(handle2%,STR$(out))
240 BPUT# handle2%,13
```

Listing 2. Creates an import file for *InterChart*

Continued on page 41

Overlaying graphs

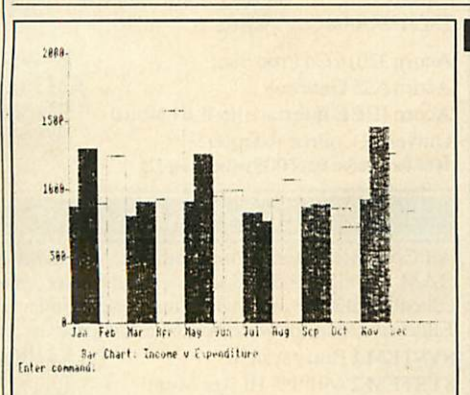


With the income graph displayed (using option 7), the expenditure graph can be overlaid by pressing f0 and then entering its name when prompted.

Note that the whole graph is overlaid, including any annotations, so if titles are used in the same place it can make combined graphs messy. As a general rule, if you plan to overlay graphs, it's best to annotate them after they have been overlaid. Alternatively, re-import the data using a slightly different graph name and overlay these instead.

To clear the overlays away press function key f2.

Bar charts

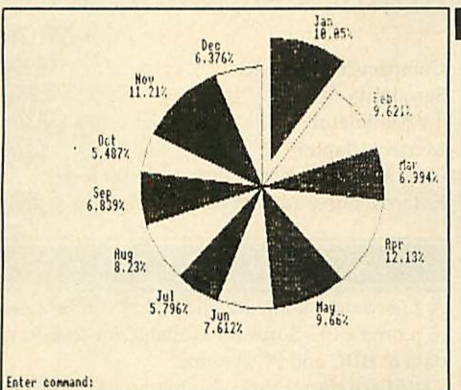


With overlays cleared (f2) it is possible to change the graph type from line to pie or bar chart.

The different types of charts have different uses, according to what you are trying to convey with your graphic presentation of data. For instance, in our example, a bar chart (left) displays clearly how each month's expenditure compares with that month's income. Conversely, a pie chart is a useful way of showing one month's income as a percentage of the year's total.

To create a bar chart, first display the graph or graphs, then press f3 followed by B. The data will be re-displayed.

Pie charts

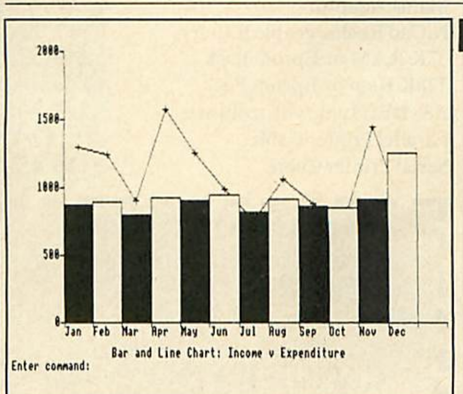


To change to a pie chart, first display the graph, then press f3 followed by P. If you have a label entered then this will also be displayed and will probably overlay the chart itself. Because of this it is a good idea to re-import the data using a different graph name – perhaps with a P or B in the filename to signify the chart type. Then the labels don't overlap and all types of graph are instantly available.

When a pie chart is displayed one segment is offset slightly. To show an alternative segment, Escape to the edit mode and position the dotted line cursor in the segment required and re-display the chart. Pressing 'H' will remove the segment altogether.

To display the pie chart in percentage terms rather than value terms press P and answer Y for yes.

Overlaying different types



Bar charts can be overlaid on line charts, as overlaying several bar charts on another one can be quite messy. All that is required is to display one graph as a bar chart and overlay the other as a line graph, in the way we've already described.

It's best to select the graph with the lowest values (in our example, expend) as the bar chart and overlay the chart with the higher values (income) on this.

Graphs can be printed at any time simply by pressing f4 if an Epson-compatible printer is attached.

Finally don't forget to save your graphs, either individually or together, using one of the save options on the main menu.

```
250 NEXT
260 :
270 CLOSE# handle1%
280 CLOSE# handle2%
290 :
300 END
310 :
320 DEF PROCwrite(file,string$)
330 LOCAL loop
340 FOR loop=1 TO LEN(string$)
350 BPUT# file,ASC(MID$(string$,loop,1
))
360 NEXT
370 ENDPROC
380 :
390 DATA "Jan",1300,870
400 DATA "Feb",1245,895
410 DATA "Mar",905,790
420 DATA "Apr",1570,920
430 DATA "May",1250,905
440 DATA "Jun",985,940
450 DATA "Jul",750,815
460 DATA "Aug",1065,915
470 DATA "Sep",885,860
480 DATA "Oct",710,850
490 DATA "Nov",1450,910
500 DATA "Dec",825,1255
```

Listing 2 continued

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305 Edgware Road, London W2 Tel: 01-723 0233 Telex: 922800

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*Monitor prices applicable only when purchased with the micro.

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27128-25 (12.5V Vpp)
27128-25 (21.0V Vpp)
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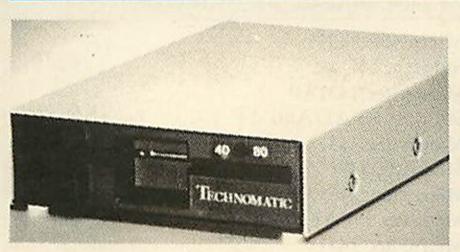
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*The mechanisms are set inside attractively styled, sturdy metal casings painted in BBC beige colour.

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50 5.25″ 40 T single sided discs with sleeves in lockable box.	**£25(b)**
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50 3.5″ 80T double sided discs with sleeves in lockable box.	**£60(b)**

FLOPPICLENE DRIVE HEAD CLEANING KIT

5.25″ Kit with 20 disposable discs	**£14.00(d)**
3.5″ Kit with 20 disposable discs	**£14.75(d)**

DISC STORAGE BOXES

DB340 Lockable 40 × 3.5″	**£8.50(c)**
DB550 Lockable 50 × 5.25″	**£6.50(c)**
DB570 Lockable 70 × 5.25″	**£8.50(c)**
DB5100 Lockable 100 × 5.25″	**£10.50(c)**

TECHNOMATIC

305 Edgware Road, London W2 Tel: 01-723 0233

PRINTERS

EPSON FX800 £309(a) EPSON FX1000	£419(a)
EPSON EX800 £395(a) EPSON EX1000	£539(a)
EPSON LQ1050	£529(a)
EPSON GQ3500 Laser Printer	£1290(a)
TAXAN KP815 £249(a) TAXAN KP915	£350(a)
NATIONAL PANASONIC KXP1081	£149(a)
NATIONAL PANASONIC KXP1082*	£175(a)
STAR LC10	£185(a)
STAR LC10 Colour (NEW)	£249(a)
INTEGREX Multicolour Inkjet printer	£519(a)
BROTHER HR20	£349(a)
NAT PANASONIC KX P3131 includes massive buffer of 38K	£249(a)
JUKI 6100 Daisy wheel printer	£295(a)
BBC/Master Parallel Lead (1.2m)	£5(d)
BBC/Master Parallel Lead (2m)	£7(d)
Compact Parallel Printer Lead (1.2m)	£9(d)
Archimedes Parallel Printer Lead (2m)	£9(d)

** Price includes Free Master printer lead and WYSIWYG + ROM*

EPSON LX800

Epson's latest budget printer offers a host of new features all utilising Epson's unrivalled knowhow of printer technology and reliability.

★ 180 cps draft/25cps NLQ ★ two modern fonts as std: Sans Serif and ROMAN. NLQ font selection from front panel ★ Tractor and friction feed ★ Single sheet guide with auto load switch. Original + 2 copies.
★ 3K input buffer with character downloading facility
★ Fully compatible with BBC & IBM graphics
★ Centronics interface as standard
★ Price including BBC master lead **£179(a)**

EPSON LQ500

Epson's budget 24pin letter quality printer provides unrivalled print quality with two built in letter quality fonts and widest repertoire of type styles at low cost. Sans Serif and Roman or draft font can be selected from the front panel. Maximum resolution of 360 × 180 dpi. Friction and tractor as standard. Parallel interface. Designed for low noise operation 55dB(A).
Introductory price incl. master lead **£329(a)**

EPSON LQ850

Epson's latest 24pin letter quality printer has been specifically designed for optimum paper handling convenience. Both single sheets and fanfold paper can be loaded simultaneously and a single lever enables the selection of either for printing. Micro adjust feature enables paper feed forward or reverse in increments as fine as 1/180" – ideal for form setting. Auto load of selected paper to printing position. Very fast printing speeds 264cps draft & 88cps LQ. Sans Serif & Roman LQ fonts can be selected from front panel as can the character pitch.
LQ850 has been specially insulated to keep the noise level down to 55db(A). Parallel & Serial interface as std.
Introductory Price including BBC Master lead **£419(a)**

MODEMS

MIRACLE WS4000 V21/23	£135(b)
MIRACLE WS3000 V21/23	£244(b)
MIRACLE WS3000 V22	£409(b)
MIRACLE WS3000 V22 bis	£537(b)
(All modems are BABT approved)	
BBC Data Cable for WS3000/4000	£10(d)
MIRACLE WS2000 V21/23 & BELL stds	£92(c)

PLOTTERS

Hitachi 672XD A3 4 Colour HPGL	£499(a)
Plotmate A4S	£420(a)
Plotmate A3M	£640(a)
Roland 880 A3 Flat bed 8 col	£599(a)

Variety of Plotter pens and accessories in stock.
Larger Plotters available. Please enquire.

PRINTER SHARERS & BUFFERS

TSB256 Printer Sharer Buffer

Provides a massive buffer size of 256K and connects three computers to one printer. Autoswitching between computers. Facility to print copies. **£189(b)**

BUFFALO PB Buffer

Parallel buffer for internal fitting to most Epson printers. Simple to instal.
PB128 (128K) **£89(c)**

PERIPHERAL & COMPUTER SHARERS

High quality switches to allow the user to switch between computers, printers, modems etc. Fully shielded metal cases, all lines fully switched.

	Parallel		Serial	
2 Computers to 1 Printer	36v36-2	£25(c)	25v25-2	£25(c)
3 Computers to 1 Printer	36v36-3	£39(c)	25v25-3	£39(c)
4 Computers to 1 Printer	36v36-4	£45(c)	25v25-4	£45(c)
2 Computers 2 Printers			25v25-x	£49(c)
X-over	36v37-x	£49(c)		
BBC Cable Set 3 to 1 (1m ea)		£24(c)		
BBC Cable Set 4 to 1 (1m ea)		£30(c)		

BBC Computer Sharer: TCS26

1 computer to 2 printers fitted with BBC cable **£21(c)**

Paper & Labels

Plain fanfold paper with microperforation:

2000 sheets 9½ × 11"	£12 (£3.50)
2000 sheets 14½ × 11"	£18.50 (£4.50)
1500 sheets A4 90gsm	£18.00 (£4.00)

Labels/1000

Single Row 3½ × 1⁷⁄₁₆	£5(d)
Triple Row 2⁷⁄₁₆ × 1⁷⁄₁₆	£5(d)

PRINTER STAND

A new style printer stand with easy paper feed and paper seperation, provides complete access to paper. Can be used with both top and bottom paper feed. Very space efficient. **£26 (b)**

PROGRAMMING ACCESSORIES/SOFTWARE

Compatible with B, B+ and Master

EpromRyter (Epromer II) EpromRyter is compatible with BBC Master only. See page 7.	£89(b)
EPROMER II	£89(b)
META ASSEMBLER	£145(b)
PORTAL EPROM EMULATOR 512K	£245(b)
TEAM Disassembler	£145(b)
EPROM ERASERS	
UV1B 6 eproms, safety cutout	£47(b)
UV1T 6 eproms, timer, safety cutout	£59(b)

MONITORS

All Monitors supplied with a suitable lead.

12", 14" and 20" MONITORS

Microvitec 1431 Std Res, 14"	£179(a)
Microvitec 1431AP Std Res + PAL/Aud, 14"	£199(a)
Microvitec 1451 Med Res, 14"	£225(a)
Microvitec 1451AP Med Res + PAL/Aud, 14"	£255(a)
Microvitec 1441 Hi Res, 14"	£359(a)
Philips 8833 14" RGB Med Res, 14", high contract screen, TTL/Linear Input, Mono/Colour Switch Sound Input. Separate controls for brilliance and contrast. This is the monitor used by Acorn with Archimedes and Compact Computers.	£239(a)
Sanyo CRT 70 14" High Resolution Monitor	£209(a)

Resolution better than Microvitec 1441, suitable for Master

Microvitec 2030CS 20" Standard Resolution RGB/Comp Video	£380(a)
Microvitec 2040CS 20" High Resolution RGB/Comp Video	£675(a)
TAXAN SUPER VISION 620 12" Hi Res/Hi Contrast Option to switch to green/amber BBC/IBM Compatible	£269(a)
TAXAN SUPER VISION 625 12" Super Hi Res and contrast RGB Monitor with option to switch to mono BBC/IBM compatible.	£319(a)
TAXAN 770+ MultiSysnc Autoscan 14", ideal for utilising the hi res modes on Archimedes. Our price includes a tilt & swivel stand	£499(a)
NEC MultiSync II 14" Enhanced version of the original NEC MultiSync. complete with tilt & swivel base. Suitable for Archimedes and PC compatibles.	£489(a)

12" MONOCHROME MONITORS

PHILIPS BM 7502 Hi Res green screen	£69(a)
PHILIPS BM 7522 Hi Res amber screen	£75(a)
Tilt & Swivel Stand for Philips Mono	£6(c)

TIME WARP

Real Time Clock, Plugs into the user port, battery back up as standard, includes manual, demo software including a diary/planner application program **£29(d)**

MONITOR ACCESSORIES

Microvitec Swivel Base (14" plastic monitors)	£17(c)
Monitor Stand Models B & B+	£10(c)
Monitor Stand Master	£13(c)
Double Tier Stand Models B, B+ or Master	£24(b)
Taxan RGB Lead	£7(d)
Microvitec Lead	£4(d)
Monochrome BNC/Phono Lead	£4(d)

All prices ex VAT and subject to change without notice.

TECHNOMATIC

17 Burnley Road, London NW10 1ED Tel: 01-208 1177

CAD/DRAWING PACKAGES

NOVACAD
Cad Package for B, B & MASTER.
(See page 5 for specification)

Tracker Ball/Mouse Version (TM)	£49 (d)
TM Version plus Tracker Ball	£94 (d)
TM Version plus Mouse	£79 (d)
Plotter Driver Generator	£15 (d)

MOUSE

AMX MOUSE with SUPER ART (pse specify B, B+ or Master)	£59 (d)
STOP PRESS (Pagemaker)	£32 (d)
EXTRA/EXTRA (utility for the Pagemaker)	£19 (d)
MAX	£17 (d)
STAND ALONE MOUSE	£34 (c)

RB2 TRACKER BALL

RB2 Tracker Ball with Icon Master (for B, B+ & Master)	£59 (c)
RB2 Tracker Ball with Cursor Control Rom (for Master only)	£59 (c)
RB2 Tracker Ball 'Stand Alone' for use with NOVACAD & other software)	£47 (c)
Cursor Control Rom for Master	£12.50 (d)
MIRRORSOFT FLEET STREET EDITOR	£35 (d)

CP/M SOFTWARE

Please send for details on our range of CP/M software for Acorn/Torch Z80 2nd Processors

BBC SOFT/FIRMWARE

DATABASE MANAGEMENT SYSTEMS

VIEWSTORE	£37 (d)
STARdataBASE	£39 (d)
MASTERFILE II	£17 (d)
ACORN OVERVIEW PACKAGE Special Offer (RRP £86)	£69 (b)

WORD PROCESSORS

ACORN VIEW PROFESSIONAL (BBC)	£69 (c)
VIEW 2.1	£35 (d)
VIEW 3.0	£45 (c)
VIEW INDEX	£12 (d)
VIEW PRINTER DRIVER GENERATOR	£8 (d)
VIEWSPELL	£29 (d)
DOT PRINT PLUS	£28 (d)
WORDWISE	£24 (d)
WORDWISE PLUS	£38 (d)
WYSIWYG PLUS	£21 (d)
SPELLMASTER	£47 (d)
INTERWORD	£39 (d)
WORDEASE	£24 (d)
SPELLCHECK III	£31 (d)
EDWORD II	£43 (c)

SPREADSHEETS

VIEWSHEET	£37 (d)
WINDOMATIC (A Viewsheet Utility)	£15 (d)
VIEWPLOT	£22 (d)
INTERSHEET	£37 (d)
INTERCHART	£26 (d)
ULTRACALC	£26 (d)
MINI OFFICE II DISC Version	
For B & B+ 40T or 80T	£14.75 (d)
For Master 80T	£17.30 (d)
For Compact	£19 (d)
MINI OFFICE II ROM Version	
For Master, Compact, B+ & B	£48 (c)
MEGA 3Rom	£82(b)

CC's integrated package offering Interword, Intersheet & Interchart on one 128K ROM. For Master, Compact, B+ & B

LANGUAGES

META ASSEMBLER	£145 (b)
TEAM DISASSEMBLER	£145 (b)
MACROM	£33 (d)
ACORN MICRO PROLOG	£62 (d)
ISO-PASCAL	£51 (c)
ISO-PASCAL STAND ALONE GENERATOR	£30 (d)
OXFORD PASCAL (40 or 80T) Specify B or B+	£36 (d)
OXFORD PASCAL for Master	£52 (d)
ACORN LOGO	£46 (c)
LOGOTRON LOGO	£55 (c)
BBC PUBLICATIONS OPEN LOGO	£59 (c)
ACORN LISP ROM	£39 (d)
ACORN FORTH ROM	£39 (d)
ACORN COMAL ROM	£39 (d)
MICROTEXT	£52 (c)
MICROTEXT PLUS	£229 (b)

COMMUNICATIONS

TERMULATOR	£25 (d)
COMMSTAR II	£28 (d)
MAYA Comms Package (NEW) See next page for details	£49 (d)
MODEM MASTER	£11 (d)
COMMAND	£34 (d)
MASTER TERMULATOR	£34.75 (d)

See next page for details

UTILITIES

ACORN BASIC EDITOR	£24 (d)
MONITOR (BBC Pub)	£19 (d)
SLEUTH	£23 (d)
TOOLKIT PLUS	£31 (d)
TOOLBOX 2 (BBC Pub) Manual	£9.50 (d)
Cassette	£9 (d)
ACORN GXR GRAPHICS ROM specify B or B+	£24(d)
PRINTMASTER	£24 (d)
PRINTWISE	£24 (d)
DUMPMASTER	£26 (d)
FONTWISE PLUS	£17 (d)
ADV TELETEXT UTILITIES ROM	£7.95 (d)

COMPACT (all on 3½" disc)

ARTROOM	£27 (d)
FONTWISE +	£22 (d)
FONT EDITOR	£22 (d)
BETABASE	£27 (d)
WHITE KNIGHT MKII	£16 (d)

BBC PUBLICATIONS EDUCATIONAL SOFTWARE

A series of programs developed in many cases alongside Radio & TV programmes by BBC's Education Department which supplement the classroom studies by moving and colourful displays helping in clear understanding of a variety of subjects. Some packages also include audio cassettes.

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MATHS WITH A STORY 2	Cass£8 (d)
NUMBER GAMES	Cass/EC£7.50 (d)
USING YOUR COMPUTER	Cass£24 (c)
THE HALL OF MIRRORS	Disc£13 (d)
MATHS	Disc+AudCas£17(d)

SECONDARY LEARNING

TECHNOLOGY & DESIGN Pt1	£21.50 (c)
ELECTRIC FIELDS	£10.50 (d)
ADVANCED LEVEL STUDIES: STATISITICS	Disc£23 (d)
ADVANCED STUDIES: GEOGRAPHY	Disc£17 (d)
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	Book£8 (d) Audio Cass£5 (d)
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S.T.:WAVES	Disc£14 (d)
S.T.:RELATIONSHIPS	Disc£14 (d)
S.T.:BONDING	Disc£14 (d)
S.T.:ELECTROMAGNETIC SPECTRUM	
S.T.:ELECTRONICS IN ACTION	Disc£14
S.T.:NEWTON & THE SHUTTLE	Disc£19
S.T.:ECOLOGY	Disc/EC£19
S.T.:POLYMERS	Disc/EC£19 (d)
S.T.:CLASSIFICATION & PERIODIC TABLE	Disc£20 (d)
S.T.:FOOD & POPULATION	Disc£20 (d)
SEC.SCIENCE MICROTECHNOLOGY	Cass£7 (d)
SEC.SCIENCE:THE MOLE CONCEPT	Disc/Aud/EC£16 (c)
BIRD SPY	Disc£13 (d)
GEORDIE Racer	Disc£13 (d)

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VU-TYPE PROFESSIONAL	Disc£19 (d)
WHITE KNIGHT MK II (for 1770 DFS)	Disc£16 (d)
BATTLEFIELDS	Cass£8.50 (d)
A VOUS LA FRANCE	Disc£20 (d)
	Book£5.25 (d) Aud Cass(2)£7 (d)
ESPANA VIVA	Disc£19 (d)
	Audio Cass(2)£8 (d) Book£6.95 (d)
	(2) £7.50 (a)
DEUTSCH DIREKT	Disc/aud/EC£16 (c)
	Book£5.95 (d)
BLACK QUEEN A long awaited bridge game. (1770DFS)	£13(d)
BISMARCK History of the famous battleship. (1770DFS)	£13(d)

TECHNOMATIC

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BOOKS

No VAT Carriage Code (c)

LANGUAGES

6502 Assy Lang Prog £19.95
6502 Programming £13.95
8086 Book £23.95
Acorn BCPI User Guide £15.00
Acorn FORTH £7.50
Acorn LISP £7.50
Acorn ISO Pascal Ref Manual £10.00
Intro to COMAL £10.00
Intro to LOGO £7.50
Micro Prolog Ref Manual £10.00
Introduction to Turbo Pascal £14.95
Prog the Micro with Pascal £8.50
The Supervisor's BBC Micro £10.95

BBC MICRO GUIDE BOOKS

Inside Information £8.95
Maths Prog in BBC Basic £7.95
The Friendly Computer Book £4.50
Toolbox 2 .... £10.95

ARCHIMEDES

Archimedes Reference Manual .... £29.95(b)
ARM Assembly Language Prog .... £12.95(b)

PROGRAMMING/UTILITY

Advanced Sideways Ram User Guide £9.95
Advanced User Guide (BBC) £15.95
Applied Assembly Language on the BBC £9.95
BBC Micro Advance Programming £9.95
BBC Micro Ref Guide (B Smith) £10.95
BBC Micro Sideways ROM's RAM's £9.95
Guide to the BBC Rom £9.95
Beginners Guide to W.P. £7.95
Mastering Assembly Code £8.95
Mastering Interpreters & Compilers £14.95
Master Operating System £12.95
Mastering View, Viewsheet & Viewstore £12.95
View by B. Smith £12.95
View 3.0 User Guide £9.00
Viewstore User Guide £9.00
Viewsheet User Guide £9.00
Wordwise Plus £9.95

SOUND & GRAPHICS

Computer Graphics & CAD Fundementals £9.95
Mastering Music £6.95

DISC DRIVE SYSTEMS

Advanced Disc User Guide £16.95
Disc Book £3.50
Disc Programming Techniques £7.95
Disc Systems £6.95
File Handling on the BBC £6.95
Discovering Disc Drives .... £POA
Practical Disc File Techniques £5.95
Mastering the Disc Drive £12.95
Mastering DOS plus £12.95

APPLICATIONS

Interfacing Proj for BBC £6.95
BBC and Small Business £5.75
The Software Business £5.50

Mastering Operating System (David Atherton) £6.95

WYSIWYG PLUS

WYSIWYG PLUS is a printer and screen utility for Wordwise Plus, View, Interword, and Basic users, supplied on a 16K Eprom. To obtain a particular printer effect, such as enlarged text, it used to be necessary to discover the appropriate 'printer control code' from your manual and incorporate it into your text. Secondly, you had to print several trial copies in order to position the effect correctly in relation to the rest of your text.

WYSIWYG PLUS simplifies this trial and error approach using easily remembered *commands. For example, *ENLARGED not only selects enlarged text on your printer, but uniquely shows you double width characters on your screen, even from within Wordwise Plus!

WYSIWYG PLUS incorporates a logo editor. Just draw your design on screen using the arrow keys, and save the results. Use the *GRAPHICS command to incorporate your design anywhere in your text; position and see your design in your text before faithfully reproducing a hard copy.

There is also special help for daisy wheel users. The *WHEEL command will prompt you to change daisy wheels whenever a change in type style is about to occur.

WYSIWYG PLUS is designed to work with the following systems:

BBC Model B	6502 Second Processor,	BBC Master 128	All printers (Except lasers)
BBC Model B+	Turbo coprocessor	BBC Compact	

WYSIWYG PLUS workspace is relocatable.

MAYA TERMINAL EMULATOR

A comms package for the professional user. MAYA emulates DEC VT52, VT100 and Tandberg TDV2215. Special BBC VDU mode allows full access to the BBC VDU driver.

Menu driven software allows the setting up of parameters and function key definitions which can be saved to disc for future use.

Flexible command parser provides a uniform user interface and allows full access to * commands and HELP facilities.

Xmodem and Kermit file transfer protocols are included as standard. Unique feature of MAYA is that Kermit can also be used in 'remote mode', which allows file transfers to be initiated by other computers connected to the BBC. File transfers can also be done with a 'dumb' ASCII protocol. Open architecture allows for expansion and addition of new features. Options currently under development are graphics drivers for Tektronix 4010/4014 emulation, TDGR driver for TDV2215 and a Viewdata patch (provisional version included in the current issue). Registered users will be provided with regular updates and customisation service will also be available to those interested.

The package comprises of a rom, utils disc and a comprehensive manual. It is compatible with Master, Models B & B+. It supports DFS, ADFS, NFS and ANFS filing systems.

BLACK QUEEN

A contract bridge program from BBC Publications both for beginners and for club players. Features include rebid and/or reply of any deal just played. Deals can be saved to a disc. Unique feature of Black Queen is its ability to construct deals from standard or classic ones in newspapers etc.

Compatible with Master, B and B+ **£13(d)**

EDUCATIONAL/FUN SOFTWARE BUNDLE

Wordmover, Drawstick, Wordplay, Pantry Antics, Locomotion

These programs are supplied from the BBC Publications Educational Software range and will be supplied on a 5.25" disc for BBC Master, B+ and B and on a 3.5" disc for the Compact.

5.25" Disc £17.50(d)
3.5" Disc £18.50(d)
(Normal RRP over £40)

VU-TYPE

Do you have finger trouble when typing?
Do your letters look like this?

Dear Sor,
I wuold like to...

then you need:

VU-type, a complete touch typing program produced by BBC/Pitman.

It allows you to learn at your own pace and has a wide range of exercises. Screen displays show the keys you have pressed and it will report on your speed and accuracy.

Supplied on a 40T Disc with a manual.

Available at a special price of £7.50(d) instead of the usual £15. Offer valid while stocks last.

BISMARCK

An enthralling game of strategy involving the famous German battleship of the same name.

You can play the role of British Navy in its quest to find the Bismarck and sink it or take either British or German role against another player. It requires the highest qualities of judgement, observation and decision to plan strategy and tactics to plot the death of Bismarck. **£13(d)**

PRINTER ACCESSORIES

EPSON ACCESSORIES:

Interfaces

8143 RS232 .... £30 (d)
8148 + RS232 + 8k .... £65 (d)
8177P NLQ for FX80 +/FX100 + ... £99 (d)
Parallel & Serial Buffers of various size also available.
LQ800 Tractor Feed .... £47 (b)
LQ1000 Tractor Feed .... £52 (b)

SHEET FEEDERS:

LQ850 .... £135 (b)
LQ1050 .... £169 (b)
EX800 .... £135 (b)
EX1000 .... £309 (b)
FX800 .... £135 (b)
FX1000 .... £179 (b)

Ribbons:
RX/FX100/100 +, FX105 .... £7 (d)
RX/FX80/80 +, FX85 .... £4 (d)
LX80/LX800 .... £4.50 (d)
LQ800/850 .... £8.50 (d)
LQ1000/1050 .... £10 (d)
EX800/1000 .... £7.50 (d)
H180 Pen Set (Aqueous/Ball point) .... £8.25 (d)

HITACHI 672 Plotter

Aqueous Pen Set six pens .... £18.50 (d)
Oil Based Pen Set six pens .... £25.00 (d)

TAXAN CANON Accessories:

Ribbon, KP810/815/910/915 .... £6 (d)

Star Printer

NL10/LC10 Sheet Feeder .... £52 (b)
NL10/LC10 Ribbon .... £4.50 (b)

National Panasonic KX P1080/81

Spare Ribbon .... £4.50 (d)
KXP3131 Tractor .... £90 (a)
KXP3131 Sheet Feeder .... £189 (a)
KXP3131 Ribbon .... £4.50(d)

JUKI 6100

Tractor Feed .... £149 (a)
Ribbon (Carbon) .... £2.00 (d)
Sheet Feeder .... £219 (a)

BROTHER HR20

Sheet Feeder .... £229(a)
Tractor Feed .... £116 (a)
Spare Ribbon Nylon .... £3.00 (d)
Spare Ribbon Carbon .... £4.50(d)

INTEGREX INK JET COLOUR PRINTER

Spare Ink Cartridge Black .... £9 (d)
Spare Ink Cartridge Colour .... £15 (d)
Paper Roll .... £7 (d)

Printer Leads:

BBC Parallel Lead (1.2m) .... £6 (d)

PAPER & LABELS

Plain Fanfold paper with micro perforations:
2000 sheets $9\frac{1}{2}'' \times 11''$ 60 gsm/sq m £12 (£3.50)
2000 sheets $14\frac{1}{2}'' \times 11''$ 60 gsm/sq m £18.50 (£4.50)
1500 sheets A4 90 gsm £18 (£3.50)

Labels/1000:

Single Row $3\frac{1}{2} \times 1\frac{7}{16}''$ .... £5.25 (d)
Triple Row $2\frac{7}{16}'' \times 1\frac{7}{16}$ .... £5 (d)

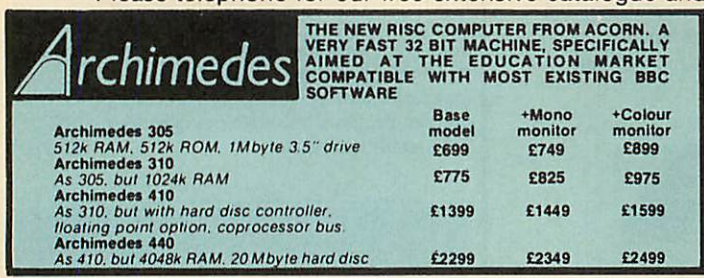
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THE NEW RISC COMPUTER FROM ACORN. A VERY FAST 32 BIT MACHINE, SPECIFICALLY AIMED AT THE EDUCATION MARKET COMPATIBLE WITH MOST EXISTING BBC SOFTWARE

	Base model	+Mono monitor	+Colour monitor
Archimedes 305 *512k RAM, 512k ROM, 1Mbyte 3.5" drive*	£699	£749	£899
Archimedes 310 *As 305, but 1024k RAM*	£775	£825	£975
Archimedes 410 *As 310, but with hard disc controller, floating point option, coprocessor bus*	£1399	£1449	£1599
Archimedes 440 *As 410, but 4048k RAM, 20 Mbyte hard disc*	£2299	£2349	£2499

ACORN

NEW MASTER COMPACT series. Standard system is 128K, single 3.5 inch drive, bundled software.

Compact entry system £349.00
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Compact with mono monitor £389.00
Compact with colour monitor £529.00
RS 232 interface for compact £26.00
Extra 3.5in drive for compact £99.00
PAL TV adaptor for compact £26.00
Master 128 .... £379.00
Master econet module £43.47
Turbo upgrade £108.00
64K upgrade kit £34.74
Master 512K upgrade £199.00
10 Mbyte Hard disc with fileserver £1086.95
30 Mbyte Hard disc with fileserver £1608.95
Eprom cartridges £11.95
Acorn DNFS kit £82.60
1770 upgrade kit £43.42
ADFS ROM £26.04
ATPL Sideways RAM/ROM board £39.00
CONCEPT Keyboard £124.95
View manual £10.00
Viewsheet manual £10.00

DISC DRIVES

Opus 5802 400k DS 40/80 track £109.00
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MEAN DRUM MACHINE

You don't need an expensive drum machine to generate rhythms for your music – just program your micro

Joe Telford

Have you been to a disco lately? I have to come clean and say that I haven't myself, but let me also say it's only because of an allergy to loud noises – my idea of a musical experience is a tea dance at the Waldorf. But I do have the occasional experience of the events, as my darling daughter requires a half-termly visit to the parish hall disco in the small hamlet footing Telford Towers.

It was on one such occasion in my role as chauffeur that I noticed the words of a song were quite unimportant. The only function of the music was to provide a beat for these mini-debs to, er, dance to.

Children generally live in a noisy world. Within that world, rhythm is pretty important, and although some develop an intuitive sense of rhythm, many don't. Merely listening to a rhythm doesn't make you adept at producing them or playing in time. Adults too have the same problems. Whatever your age or musical ability, there is much fun to be had from exploring sounds and rhythms. With the BBC micro you have the facility to produce a drum kit without the expense of buying or building your own.

Making percussive sounds

A percussive sound is what you hear when you hit something. Tap your desk, your computer screen, your disc drive and each one will give a different sound. Tap with a pencil and the sound changes from what you get when you tap with your fingers. Have you ever tapped teacups and saucers with a knife? This is real percussion.

To produce such noises with the BBC micro, you have to shape a noise to sound like percussion. The BBC micro can make and modify noises so that the same sound generator and loudspeaker sound different. Remember that the SOUND statement has four parts; channel, volume, pitch and duration. If we want to examine sound effects linked to percussion, we have to use channel number zero. The name given to the type of sound which channel zero generates is 'white noise', a sort of hiss sound. The pitch values from 4 to 6 control the amounts of high and low frequencies which make up this hiss. First type:

SOUND 0,−4,4,20

When you press Return try to describe the sound. Now try SOUND 0,−4,5,20 and SOUND 0,−4,6,20. Try them a few times and use your imagination to decide which is closest to, say, the sound of rubbing your hands together. Now alter the second number from −4 and try it with different values up to −15.

Try to imagine real life which might make these noises, a kettle, wind, a storm at sea or trains perhaps. With this last one, you can very quickly write a steam train program using channel zero – type in the listing below. Notice how the 'beat' of the train is steady in each section.

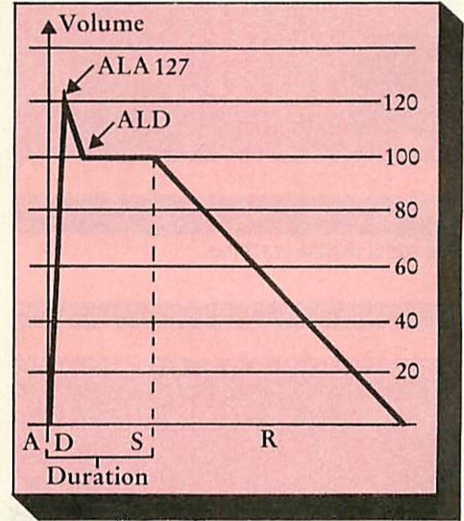


Figure 1. ADSR envelope for percussion

```
 10 REPEAT
 20 FOR slow=1 TO 10
 30 SOUND 0,-8,4,15
 40 SOUND 0,0,0,10
 50 NEXT
 60 :
 70 FOR puff=1 TO 10
 80 SOUND 0,-10,4,10
 90 SOUND 0,0,0,5
100 NEXT
110 :
120 FOR fast=1 TO 10
130 SOUND 0,-15,4,5
140 SOUND 0,0,0,3
150 NEXT
160 UNTIL FALSE
```

Unfortunately the BBC micro doesn't come equipped with a full set of percussion instruments, and so we need to modify the sound of the percussion voice by packaging it in what is called an envelope. The envelope shows how the volume of the sound varies through time. Figure 1 shows what we call an ADSR envelope for a sound. The acronym ADSR stands for Attack, Decay, Sustain and Release, and each relates to a different part of the envelope's shape. The 'attack' element is the speed with which the sound builds up from silence to full volume. Decay is the speed which the sound decreases in volume from full volume to the level which it sustains for the rest of the sound. The release element is the tail off in sound back to silence when the sound finishes playing. This last element is particularly important in drum playing, because the tail-off should be gradual unless another sound is played, at which point the first drum sound should vanish altogether.

Because of the way that the BBC micro's sound chip works, we can only have one percussion instrument sounding at a time, and so two rhythm tracks will be difficult to produce. However this is not so great a problem as you might think.

Setting the envelope

Figure 1 shows the general ADSR envelope for percussion, and this envelope is used within the programs in the yellow pages. These can be viewed like this.

```
   ENVELOPE 1,1,0,0,0,0,
0,0,126,-5,0,-1,126,100
   SOUND 0,1,4,1
```

The first value is simply the name of the envelope, ranging from zero to 15. The second value is the time base of the envelope in hundredths of a second – effectively the scale along the bottom of figure 1. The next six values are all set to zero and indicate the pitch changes to the sound as it is played. The last six values are most important because they give the effect of percussion. The first of these six (126) is the rate of increase in volume during the attack phase. The next is the decrease in volume per timebase unit during the decay phase. The next is the decrease in volume over the sustain part of the noise (zero or flat in this case), and the fourth value (−1) is the slow tail-off in volume if no other notes are sounding. The last two values are the volume settings for the end of the attack part of the envelope and the end of the decay part of the envelope.

Applying envelopes

Try typing:

```
   ENVELOPE 1,1,0,0,0,0,
0,0,126,-5,0,-1,126,100
```

The result will be a cracking sound. Now try pitch values of 5 and 6 in the SOUND statement. Notice that the volume setting is intentionally set to 1 rather than −8 or −15. This is so that envelope 1 is used for the volume pattern – negative numbers mean a straight volume setting, positive numbers mean an envelope.

A simple drum machine

Enter listing 1 on the yellow pages, called DRUM1, and save it. RUN it and you will get a very short introduction to the program, then after pressing Space, a list of instruments available will appear. Make sure the Caps Lock is engaged then tap a key indicated on the screen; that sound will



Trying out sounds with listing 1

The basic rhythm machine

A simple 4/4 beat

be played. Because the sounds are only my impressions of the instruments, I fully expect you to tweak the envelopes to improve the sounds. I'd be particularly grateful for a better cymbal sound, which I feel could be more impressive.

Notice that of the five sounds available, three are generated using envelope one and channel zero. The 'high', 'mid' and 'low' drums differ only by using pitch values of 4, 5 and 6 respectively. The percussion sounds are extended by using channel one as a triangle, with its pitch set to 190, and then fed through envelope 1. The cymbal is more complex, because it uses two sounds, a triangle-like sound at pitch 180, played alongside a high drum sound. A separate envelope is used for this to improve the quality of sound, and to make it more 'fuzzy'. Finally to give the ringing effect of the cymbal, the pitched note is replayed after a few hundredths of a second to add to the chiming sound which is associated with some cymbals.

This program is a very easy introduction to the sort of percussion sound that the BBC micro is capable of. Note that the sounds fall into two categories: tuned percussion, ie, the triangle which makes a noise at a set pitch when hit; and untuned, ie, the drums whose pitch is not associated with a particular note, although they can still be classed as low, mid and high drums.

Enter rhythm

The most natural thing to do when playing with this simple program is to start to form patterns of sound:

tar tar ta ta *tar* ta ta ta *tar* ta *tar*

When you tap this out by hand on the desk, you naturally tap harder when you get to the italicised beats. On the simple percussion machine, just select an instrument and tap out the rhythm on the keyboard waiting a tiny while longer after each italicised beat.

Automated rhythms

If you are given a drum kit, you tend to sit down and play. But pity the poor drummer – he has the task of maintaining time for a whole band. No wonder that in many famous groups, the drummer is becoming automated with pre-recorded sounds or MIDI-controlled instruments.

There are benefits to having your rhythms in a box; it generates them on demand, is never out of tune or time and it can produce brilliant drum rolls. For a band, the few hundred pounds for such a system is very quickly repaid.

However, Acorn users can make a drum machine by extending our simple program to cope with rhythm patterns. These can be entered from the keyboard, then replayed at different speeds.

There are two programs for this, both included in the yellow pages. The one which we will describe here is listing 3, which was designed to work on a Master 128 or Compact. Listing 2 is a smaller version. It will work on a BBC B if PAGE can be lowered to &1400. To run listing 2, type:

```
PAGE=&1400
CHAIN "DRUM2"
```

A BBC micro drum kit

Type listing 3 into the machine, then save it to disc as DRUM3 so that if there are any mistakes, the program can be reloaded

easily. Because the program generates its own data files, it might be worth reserving a new disc for its use. It will also be useful to build a !BOOT file, and this can be done easily as follows:

```
*BUILD !BOOT
0001 CH. "DRUM3"
0002 Escape
*OPT4,3
```

Starting the program

RUN the program and the front page will appear. The bottom of the screen is used as a message space to tell you any important actions which you should take. On either side of the boxed area is a column of numbers which ascend in multiples of 12 to 120. These tell you the number position of any box in the grid in the centre of the screen. This grid is actually 120 beats long and starts in the top-left, moving left to right and down the screen to beat 120 which is in the bottom-right corner. The other two messages are the percussion track number which is set at zero to start, but increases to a maximum of five, meaning that we can hold five tracks in memory at any one time. The version for the BBC micro has only one track, because of memory constraints. The other box tells us the tempo of the rhythm track in beats per minute. This is normally set at 480 beats per minute. Musicians will recognise this as four semi-quaver beats to the crotchet. I decided to work in semi-quaver intervals so that quite complex rhythm patterns can be developed, but setting tempo to 960 allows demi-semi-quaver patterns. Setting Tempo to 120 increases the time interval to crotchet beats, but will allow you to write a longer percussion track.

The only keys which affect the grid are the function and cursor keys. The cursor keys move the yellow cursor around the grid. Notice that it wraps around at both left and right margins and from top to bottom. It also wraps from last to first beat.

The function key overlay strip

On the right is the function key strip for this program. Notice that not all the keys are in use, and that the normal keys control major program functions. Shift and CTRL keys are used to enter instruments to make up a rhythm pattern. There are seven instruments available, and these can be played either loudly or quietly. This facility allows us to accentuate individual beats.

Let's start by putting in four crotchet beats of a high drum, which might be quite useful as a rhythm backing in many tunes.

The yellow cursor appears around the first beat in the track. Press CTRL and f0 to enter a loud high drum beat in this position. Now move to position five, leaving three blank beats, and place a soft high drum using Shift and f0. Repeat this in position nine and in position 13, the first beat of the second row. Now move to position 17, under the first 'h' in the top row, and press Shift or CTRL and f7. This places an 'R' in that beat; this informs the program that it should repeat the pattern up to this point over and over.

If you make a mistake, then move the cursor over the incorrect beat and press the Delete key on the keyboard – not f7 – this will remove the offending beat, and you can replace it with another instrument. Once the result looks like this:

```
H - - - h - - - h - - -
h - - - R
```

press Play (f0). The rhythm which you have designed will begin to play. For the musicians, this is a single bar of 4/4 time, stressed on the first note of each bar. When the moving star reaches the R at the end of the pattern, the whole thing repeats. To stop the sound, simply press Escape. The cursor will reappear and you can edit your work. Try this simple pattern:

```
H - - - h - - t H - - -
m - t - R
```

or this one:

```
L - t - m - t - L - t t
m - t - R
```

Both are in 4/4 time, but you can switch to waltz time (3/4) by designing a bar like this:

```
H - - - h - - - h - - -
R
```

or like this:

```
L - - - m - - - m - - l
R
```

Notice that the last beat is an accidental, to improve the flow of the rhythm. Note also that these rhythm tracks are quite simple, being only one bar in length. It is a simple matter to extend the rhythm pattern right up to the full 120 beats, as shown in figure 2. Here a simple 4/4 rhythm pattern is designed to change progressively, so that the rhythm track becomes interesting.

The other functions

While a rhythm is being played, the only operating key is Escape. Once pressed, you have access to the other keys on the function key overlay. The lower row on the overlay indicates the function of the red keys by themselves. Keys f1 and f2 control the tempo between 60 beats per minute and 960 beats per minute. Pressing f1 slows the

ACORNUSER

	Shift	CTRL
Play		High
Dec Tempo	Soft	Med
Inc		Low
Clear	Soft	Cymbal / Loud
Cat		Triangle
Save		Woosh
Load		Doosh
Delete	Repeat	
Exit		

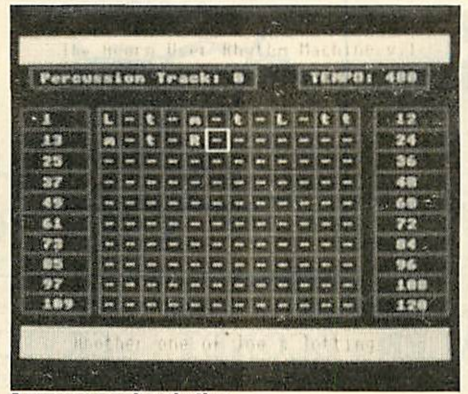
tempo by 10 beats per minute, pressing f2 increases the tempo by 10 beats per minute. A beep indicates that you have reached the limits of the tempo range.

Function key f3 erases the beats in the grid, effectively clearing out the current rhythm pattern recording. Red key 4 blanks the screen and displays a list of programs and data files on your disc. Once viewed this catalogue can be removed, and the rhythm track editing screen restored by pressing the Space bar.

Key f5 allows the current rhythm to be saved to disc, and prompts for a filename. To get a catalogue at this point, simply press Return. Pressing Escape at any point returns to the rhythm track. Remember not to enter more letters in a filename than the filing system can cope with – seven for DFS or 10 for NFS or ADFS.

Function key f6 allows a new rhythm to be loaded from disc; it prompts for a filename. The Return and Escape keys work as above, and again remember the number of letters which the filing system accepts. Function key f7 prompts for a file to delete, then removes it from disc. Again a catalogue is available with Return.

The last function key is f8, which stops the program. Be careful how you use this.


A more complex rhythm

In the Master version of the rhythm machine there are six rhythm tracks labelled 0 to 5. Switching between tracks is done by pressing a number key from 0 to 5. Because of lack of memory, the BBC model B version does not have this facility – only one track can be written. The benefit of the Master version is that up to six patterns can be stored for instant access, and then saved to disc, one by one. But remember that loading and saving only operates on the current rhythm track! To save all the patterns, you'll have to save them one by one and load them individually as well.

Improving performance

Most musicians are disparaging about the tiny sound chip of the BBC micro. But it provides a good entry level sound system to explore music. Its output can be improved by replacing the internal speaker with a large eight ohm speaker, directly connected to the speaker terminals.

You can also improve the sound quality by connecting the micro to a hi-fi. On a BBC micro you can usually connect an amplifier 'aux' input to PL15 – the quality of the sound is surprisingly good.

Using the drum programs from the yellow pages, multi-tracking is feasible too – either by over-recording the rhythm tracks and replaying, or by writing tracks on more than one micro, then replaying in synchronisation. To do this properly, one micro should be able to send all the others a clock pulse to help them keep time. Finally for all you budding musicians, a simple switch connection into the user port should give you a set of drum pads to play. But that, as we say, is another Jotting, so get to it and hit that beat!

See page 81 for details of the listings. They are available on 5.25 inch disc and cassette for the BBC B and Master – see page 97.



ILLUSTRATIONS BY INGRID DARRACOTT

KNOW THE SCORE

The Hybrid System has grown into a powerful tool for musicians and non-musicians alike

Ian Waugh

The Hybrid Music System is an exciting product. It aims to provide a total music programming and production evironment. The system currently consists of three items of hardware: the Music 5000 synthesiser, the Music 4000 keyboard and the Music 1000 amplifier. By the time you read this the Music 2000 MIDI interface will be available.

The Music 5000 houses the synthesiser circuitry, the bit which makes the sounds. It has 16 digital oscillators which each form one channel of sound. Channels are normally paired to produce a single voice but a voice be assigned more than one pair of channels. Each channel can be controlled independently so the scope for producing a wide variety of sounds is vast. Proof of this can be heard in the demo programs supplied with the system.

Each channel can have its own stereo position, so a single instrument using two channels can be a true stereo instrument. It's possible for different parts of a single instrument sound to come from several positions in the stereo spread. The sound quality is high and even good enough for certain professional applications. The system was used by composer Patrick Gowers to help create the music for Granda TV's series, *The Return of Sherlock Holmes*.

The output volume appears quite low; but Hybrid have kept it that way so that at maximum volume it will not overload the typical hi-fi DIN input and blow up your stereo.

The Music 5000 plugs into the BBC computer's 1MHz bus and includes a pass-on socket so you can still connect other equipment to the bus. It draws its power directly from the mains. The audio output is a DIN socket. Many hi-fi systems have a DIN input but there are just as many with phono sockets. If yours is one you'll need a DIN to stereo phono lead.

The Music 500 was the forerunner of the Music 5000. It uses exactly the same hardware, but the Music 5000 box has had a slight modification made to the 1MHz bus to ensure compatibility with the Master. This was necessary due to Acorn's unfortunate decision to alter the bus. Although the Music 500 was not designed to work with the Master, which wasn't around in those days, and is not guaranteed to do so, some 500 and Master combinations work fine – mine does.

What differentiates these systems is the software they run. If you have a Music 500, an upgrade to the more sophisticated and significantly easier to use Music 5000 software is highly recommended.

The second piece of hardware to appear for the Hybrid Music System was the Music 4000, a four-octave keyboard of Italian design housed in a black plastic-coated steel case. A foot switch plugs into a jack socket on the back and a 1.4-metre length of ribbon cable plugs into the computer's user port.

Soon after the Music 500 was launched ATPL released the Symphony keyboard which could be used to play the Music 500 in real time. The Symphony is no longer available but Hybrid have put together a Symphony upgrade pack to give Symphony owners the Music 4000 facilities.

The third item of hardware is the Music 1000 amplifier, which was designed primarily for use in education. It's a stereo amp housed in the same type of box as the Music 5000. It has two mixable inputs which can handle the Music 5000 and either the BBC's internal sound output or another instrument. There are three headphone sockets on the front panel and a special output line can be used to drive a tape recorder. Output is rated at 8W and the unit is ideally suited to driving bookshelf speakers.

The Hybrid Music System is compatible with all versions of the BBC computer and with most non-standard systems, too. If your micro has shadow RAM fitted more memory will be available in the staff editor.

An Electron version is now available which requires Advanced Computer Products' AP5 interface and &E00 DFS. It is identical to the Music 5000, except that as the Electron has no mode 7 the system uses mode 6 and the displays are in black and white. This results in horizontal lines on the staff editor screen, which unfortunately detract a little from the presentation.

The Electron has less available memory than the BBC and less processing power, so the maximum user program size is reduced and the execution of some of the programs will be slightly slower. Within these limitations however, most programs which run on the BBC will run on its

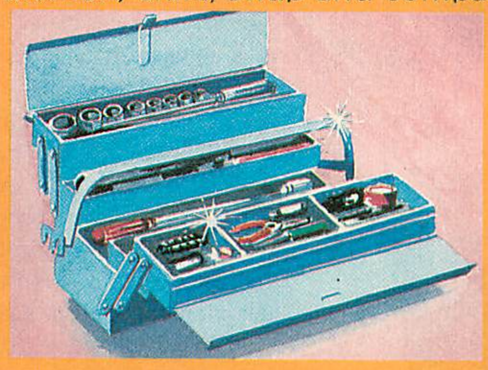


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junior cousin too.

If you've followed the development of the Hybrid Music System over the years you will know that all the hardware units and all the software modules are totally integrated. Hybrid is firmly committed to supporting the Music System and has a long term strategy for its development. Look out for the Music 3000 some time next year, and the Music 6000 soon after that.

At the centre of the Hybrid Music System is the Ample ROM. Ample stands for Advance Music Production Language and Environment and it contains all the basic functions for programming and playing music.

A version of the language called Ample BCE was supplied with the Music 500 but it was far from friendly. Many owners probably relegated the system to the cupboard under the stairs and chalked the whole thing up to experience. If you were one of them then dig it out because the new software is much simpler to use. It contains helpful music editors and control panels under the banner of the Studio 5000. You can use it quite happily to produce music without getting involved in direct programming.

This is not a tutorial so I won't attempt to explain how to program in Ample but to give you a flavour of it I'll mention some of its most important features.



Ample has been very carefully designed to be largely independent of the music output device in use. Although the Music 5000 hardware was made specifically for use with the system, Ample is quite capable of controlling other devices. The Music 2000 MIDI interface, for example, allows it to control any MIDI-compatible electronic instrument.

The basic programming unit in Ample is the 'word', and a word can be defined to do anything. For example, it may contain a sequence of notes, it may hold an instrument definition, perform a computation, produce a glissando or catalogue a disc. There are many words supplied with the system, referred to as system words, which are distinguished from user words by being in upper case.

Ample uses suffix or reverse Polish notation. For example, to save a program you would use "myprog" SAVE.

Ample's main purpose is to produce music and it has its own text-based music composition language (MCL). Notes are represented by their letter names, an upper case note moving up in pitch and a lower case note moving down in pitch. The length of a note can be specified directly with a number followed by a comma (a comma is the length word). To extend the duration of a note a slash (/) is used. The octave can be set directly with a number followed by a colon (the colon is the octave word). For example, here's a few bars of *Happy Birthday To You*:

24, 0: CC D/c/F/ e///cc D/c/G/ f///

There are other music words to produce accents, affect a transposition, slur notes, alter the tempo and define key signatures. You can create non-standard key signatures containing, for example, both sharpened and flattened notes for use in a minor key.

As a language, Ample also provides loops, conditional structures and conditional loops. It has string handing, arithmetical and random number generating functions so you can apply computational processes to music lines and structures. This is one of the most fascinating aspects of Ample and one which is relatively unexplored. Some music has been written which uses the random function and I have myself written several pieces which rely heavily on loops.

One of the most important features of Ample is 'concurrency' or multi-tasking, the ability to do more than one thing at the same time. This feature lets you play several musical parts in parallel and control the music from the keyboard as it plays.

There are three main front-end modules through which you enter your tunes: the notepad, the mixing desk and the staff editor. They are loaded from disc when required, which optimises the amount of free memory available for user programs. The modules are selected from a main menu. The modules are really application programs written in Ample, although at a level beyond that at which it will normally be used to create music.

The mixing desk

The mixing desk is the most immediately accessible module. It provides a mode 7 display of an eight-channel mixing desk complete with faders, pan pots (to select the stereo position) and instrument names above each channel. You can enter the mixing desk, play a piece and mix it live. You can also change the instruments assigned to each channel and alter the tempo of the piece. When you have produced a mix you like you enter 'MAKE' to turn the mix into an Ample word. The module MAKEs the word for you automatically. You can produce several mixes and use them at different points in the music.

The staff editor

The staff editor is used to write music on the staff using traditional music notation. It supports all the usual musical symbols – notes, rests, accidentals, dotted notes, ties, slurs, triplets, duplets and chords. You can insert volume changes, and *staccato* and *legato* instructions. When you've entered a piece, you give it a name then enter MAKE and the module turns it into a word.

When the staff editor MAKEs a music part into a word, it turns it into Ample MCL notation. This is ultimately the most powerful and most flexible form of music notation within the system: there are many things you can do in Ample which would be impossible using traditional notation. All Ample words, whichever module they are made in, can be displayed and edited in the third module – the notepad – a screen-size multi-purpose text editor. The mixing desk and staff editor are only front-ends which display the data in an alternate form, a form which may be easier to understand or more convenient for the user.

The notepad

All the words in the yellow pages program can be typed into the notepad and all except Mix were constructed there. It could have been entered in the notepad but it was far easier to select the instruments and adjust the volumes and stereo positions of the sounds in the mixing desk and let it MAKE the word.

The program was written to demonstrate a few of the features of Ample but I hope it stands up as a piece of music in its own right, too. Even if you are totally unfamiliar with Ample and music notation you will be able to pick out the strings of notes, the FOR structures and some instrument names in the listing.

As well as its use as a text editor, the notepad can create panels which can be used to define instrument sounds. Panel mode differs from text mode because it allows you to scroll through parameters. Not only can you alter numeric values but you can select new 'word' options such as waveforms. Press Shift and the available waveforms appear on the bottom of the screen. Select one with the cursor keys, release Shift and it will be in place on the panel. The notepad is the most powerful and flexible of all the music editors.

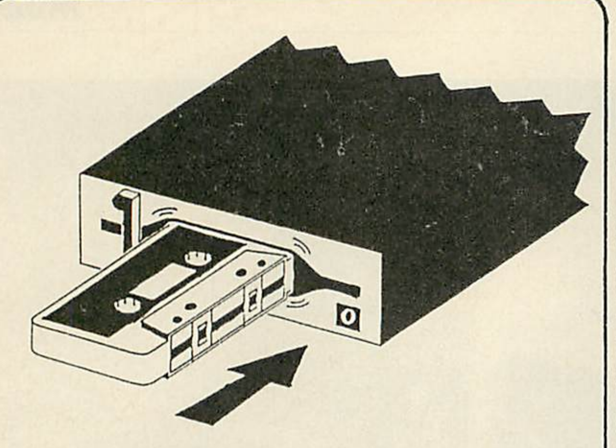


The Music 5000 synthesiser and 4000 keyboard in action with a Master

Music 4000

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Second, there is the powerful recorder screen. Here you can record music live as you play or enter it in step-time (one note at a time) into the notepad or the staff editor. As in all the other modules, the music you play is converted into an Ample word and this can be displayed in the staff editor. That's real-time musical input converted into traditional notation. If you are not a musician and haven't dreamed about this then you may not think it that spectacular. But if you have ever had to transcribe a piece onto manuscript, you will! It is one of those things which make computing both wonderful and useful.



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Total integration

The Ample environment contains every possible means of entering music into the system: traditional notation, real and step-time input from a keyboard and Ample's MCL notation. There are also the options afforded by computer-processed music and computer-generated music. You can use all or any combinations of these methods in a single piece of music.

These modules are totally integrated, like the rest of the system, so program words and data are available to all modules at all times. For example, the Music 2000 adds another module to the system which – transparently – handles the MIDI output. It's very neat.

The *User Guide* is an excellent introduction to Ample and contains all you need to know to create music with the system.

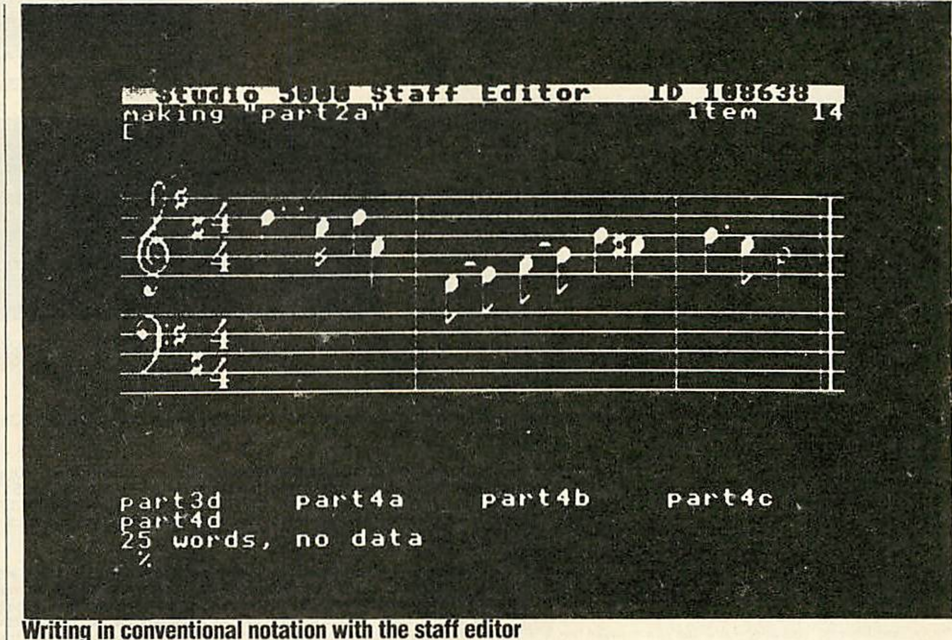
Hybrid has also recently published the *Ample Nucleus Programmer Guide* which provides more information about the system words and gives a greater insight into the language. It is essential reading if you want to delve further into and get more out of the system. If any Ample user has any suggestions for new users of this powerful music language, oddball or otherwise, then let me know. I'd be interested to see how far *Ample's* versatility can be stretched.

Ample albums

Interest in the Hybrid Music System is such that several people have produced Ample music albums for it. These are novel in that they contain music on floppy disc written in Ample software format. You load it into your Music 5000 system and it plays it for you.

The best thing about this is that it provides a demonstration. You can pinch other people's instrument definitions and examine their programs to see how they've been constructed. One exponent of the Music 5000 is Pilgrim Beart, whose music is featured on the disc supplied with the Music 5000. His albums include *Cosmix* and *Notes*. An album, *Music City* by Ian Guinan contains arrangements of pop tunes along with four original pieces. Hybrid has an agreement with the Mechanical Copyright Protection Society which allows them to release copyright material in Ample format. Part of the cost of the disc goes to the MCPS. *Music City* can, therefore, bring you *Jump to the Beat*, *Heartbreak Hotel* and Grace Jones' classic, *Slave to the Rhythm*.

The *Music City* album is really a sampler for the Music City Microbase (co-edited



Writing in conventional notation with the staff editor



The powerful recorder screen

by Ian Guinan), an area within Micronet accessible from Prestel. It began late last year, mainly to support the Hybrid Music System, and contains many tunes in Music 5000 format (along with some for the Music 500 and some which use the BBC's internal sound chip) which you can download with the aid of a modem for a nominal cost (around 75p).

Music City, has a similar agreement with the MCPS. This is good news as it means Ample musicians can arrange any piece of music for the system and sell it legally through Hybrid or Music City. No longer are you restricted to traditional tunes and Christmas carols.

Music City relies on contributions from readers so there is plenty of opportunity to get involved.

User groups

There have been Ample user groups in the past, some of which have vanished without trace, but *Amplinex* (standing for AMPLe INformation EXchange) is the latest one to appear. It is edited by Kevin Doyle and the administration is handled by Roy and Jackie Follet. The group hopes to stimulate the interest of Ample users enough to make them contribute and share their experience and exchange information.

So far the response has been huge with contributions ranging from complete pieces of music to instrument definitions, hints and tips.

The magazine comes on disc and is written entirely in Ample. The contents are accessed through a master program with a series of menus and display screens. Four issues have been produced so far. Membership of *Amplinex* is only £5 and if you send them a contribution – however small – the next issue will be sent to you free. Otherwise the cost is a mere £2.

I cannot recommend *Amplinex* highly enough: I think it is simply essential reading.

Music 5000, £161.00; Music 4000, £169.00; Music 200, £161.00; Music 1000, £161.00; Music 500 upgrade pack, £69.00.

Hybrid Technology Limited, Unit 3, Robert Davies Court, Nuffield Road, Cambridge CB4 1TP. Tel: (0223) 316910.

Amplinex, 26 Arbor Lane, Winnersh, Berks, RG11 5JD.

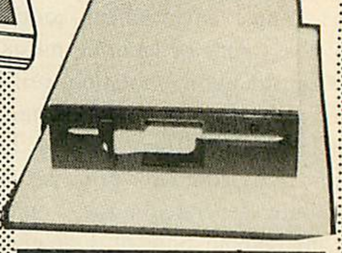
Music City, 138 Prescot Road, Aughton, Ormskirk, Lancs L39 4SW.

Micronet, Durrant House, 8 Herbal Hill, London EC1R 5EJ. Tel: 01-278 3143.

The details of Ample listing mentioned by Ian Waugh can be found on the yellow pages indec on page 81

Last April's Acorn User contained an Ample music listing by Bob Cornford-Wood entitled 'Sunrise-sunset'. Back issues are still available, as is the April listings disc – see page 97.

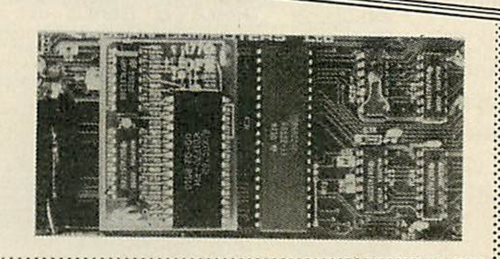
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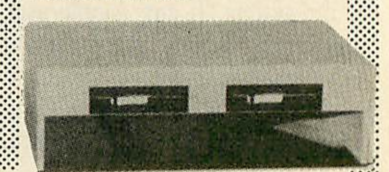
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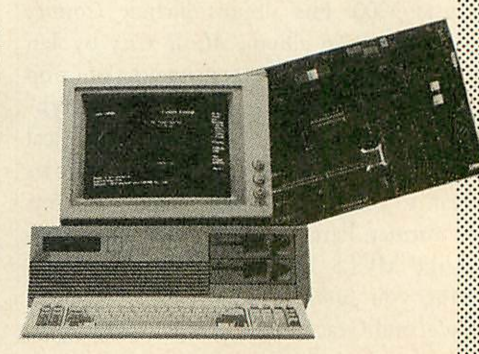
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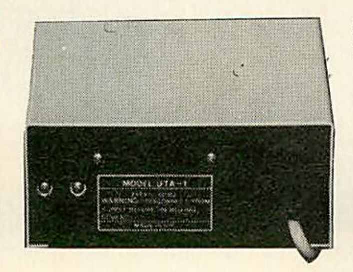
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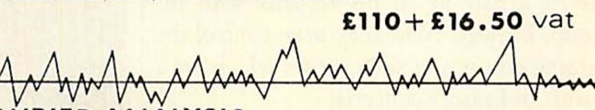
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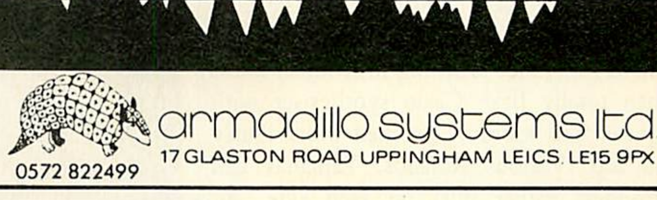
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By on-screen scrolling editor (max of 1500 numbers, 750 pairs of observations). Data can be stored, loaded, modified, formatted, listed and plotted.

OUTPUT

Text to Epson compatible printer, Graphics output uses a fast screen dump routine to Epson printer, or serial output to HPGL plotter.

PRICE £80 + VAT

Order From: Newcastle Photonic Systems, The Medical School, Framlington Place, The University, Newcastle upon Tyne, NE2 4HH.

Not many micros get the chance to shine under the Hammersmith Odeon spotlights. For Vince Clarke's collection of four BBC Bs and a Master it's all in a day's work. Since he adopted the UMI MIDI system four years ago they have played a part in all his records with his group, Erasure. Now they even control the lighting effects and slide shows which are a feature of Erasure concerts.

I spoke to Vince and producer Eric Radcliffe as they put the final touches to Erasure's latest album *The Innocents.* Its songs, including the single *Ship of Fools*, further develop Vince's trademark sound of richly textured synthesisers from its tinny beginnings seven years ago on Depeche Mode's hits like *New Life*.

The studio is full of expensive equipment, with several racks of keyboards dominated by a huge central mixing desk – all flashing lights, control knobs and sliding faders. However, Vince is sitting in front of a less than totally flash Casio synthesiser with Master and monitor perched precariously on top. Various Rolands, Yamahas and Prophets gather dust on each side. An Apple Macintosh sits unused in one of the quieter corners.

It is about seven in the evening, but in the stuffy, windowless room it could be any time of day or night. Unlike many musicians Vince prefers to work during the day and to go home in the evening. Singer Andy Bell is the opposite; he had chosen to work what Vince calls the nightshift and isn't expected for a few hours yet, so there is time for an interview with *Acorn User*.

'I started to get interested in synthesisers years ago when I was in Depeche Mode. I wasn't a very good guitarist and when these keyboards came out, cheap monophonic ones, I started using them.'

He demonstrates the jerky robotic movements the band used to make their two finger playing technique seem practised and confident and not a result of the limited technology which allowed only one note at a time to be played.

Keyboards have come a long way since then, and home computers, MIDI controllers and samplers have all helped to open up musical technology. Now the UMI MIDI system is well established and sophisticated enough to do everything Vince demands. 'We write the songs at home, mainly on the guitar, and only use all this equipment when we get into the studio. We bring in all our dodgy demo tapes, and build up the songs from them. To save studio time and money we program the drums, and perhaps the bass at home, on a Casio keyboard and a Roland TR-505.

'One of the good things about the UMI system we use is that it comes from a small company. If I don't know how to get an effect or something goes wrong I can phone up Lynton Naiff who makes it and get an answer and the help I need.'

The lyrics are left till last with singer Andy Bell just humming or yodelling the vocal lines till he and Vince have stopped arguing about the words. This sometimes causes problems but Vince thinks it is the best way for them to work.

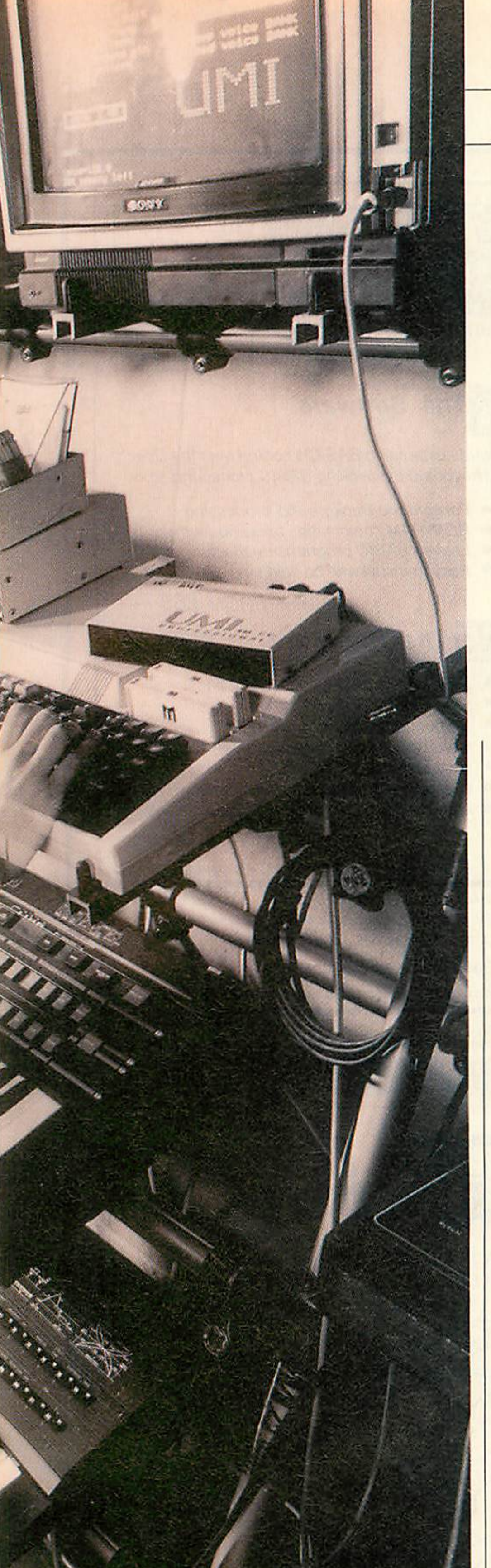
Before then the backing tracks have to be recorded. Vince works by layering one track on top of another till the sound and texture is right. Using MIDI simplifies this; in the middle of the ranks of keyboards and little black boxes is one keyboard, designated the master keyboard, and the computer and UMI controller. Pressing the keys on the master keyboard produces drum or bass sounds, or samples from the other keyboards or whatever is switched in at that

PHOTOGRAPH BY DAVE KING

ERASURE HEAD

Why does chart-topping band Erasure prefer BBCs and Masters to more expensive music-making equipment? Vince Clarke reveals all

Carol Atack



time. Vince explains: 'You start off with a two-bar pattern. You've got two ways of recording it; one-shot, where you play it once and the computer records it, and looping. Then it keeps repeating the pattern and you can add things. Using the master keyboard I can add drum sounds one by one, starting with the bass. It corrects the timing automatically, although you can get it to record slight discrepancies.

'At first I would use the computer to play things I couldn't, the fast bits, by entering them step by step. Now the edit facility means that I am able to scrutinise and correct a real performance.

'For that you leave the keyboard and turn to the computer and the edit page. There you can see what you've done visually, all the notes and mistakes.

'Each note can be adjusted. There are parameters for things like length of notes and volume. I might impose a universal gate, to make all the notes the same length, or use the slope facility to make the high hats get louder through the song. When you've made all the patterns you assign them to a page and link them up there.

'When we add the vocals, a verse or chorus might be the wrong length but it's easy to drop in extra patterns.'

One advantage of the UMI system is that it has four MIDI ports (to which the synths are connected) rather than one, as is standard on the Atari ST. Producer Eric explains: 'Having only one MIDI port slows down the handling of information. That means that if you have 16 synths connected to it they tend to get out of time.'

MIDI as a means of control is capable of much more than mere music. Vince allocates spare channels to controlling the lights: 'I assign the last four channels and some notes on the keyboards to the lights and program them just like music. It's just triggers really. It's so much better having the lights properly timed than a horrible mess, and you know they'll be the same every night.'

However it is Eric who has come up with the most inventive application of MIDI: his robot the 'MIDI Man'. 'I've already built him on a small scale. He's very humorous; he can dance, stuff like that. We've even got him to play a keyboard. At the moment he's only small but I hope to make him on a larger scale. The small version is pretty convincing but it will be very different at human size.'

While the two of them plan these diversions the central problem of the reliability of computers used in the volatile musical arena still remains. Relying on the machines, as Vince does, instead of backing tapes to provide sound on stage takes a certain amount of courage. Travelling from town to town and country to country, being flung from lorry to stage and back again takes a lot out of equipment designed to sit quietly on a desk. The BBC's firm construction gives it an advantage over many other machines for survival 'on the road'. Says Eric 'The last thing roadies are concerned with when they're unloading anything is whether they've broken it. A computer's not like a guitar; you can't put a new string on it. If it goes it goes. But our only difficulty with the BBC has been the extended model Bs where the board falls off and it rattles when you unpack it.'

There are advantages; taking a computer and a couple of boxes of discs on tour means fewer heavy keyboards and consequently a smaller road crew. Vince now takes four computers with him to avoid potential mishaps, although the problem centres not on the computer but the availability of a steady power supply. 'Sharing a power source with other equipment causes problems. Someone switches on the lights and the computer crashes.'

Vince points out that any piece of equipment is liable to fail under the strain of touring. Now he often leaves the computer to look after all the keyboards and drums, and devotes his energies to playing guitar. 'I always keep a close eye on the computer, though,' he admits. 'It's the band.'

THE UMI LEAGUE

Want to make music to professional standards? Then the UMI sequencer, which allows you to control musical instruments using your BBC micro, could be your answer

Martin Russ

If you've ever played around with the SOUND and ENVELOPE commands in BBC Basic, you'll have found that subtlety of tonal character is not the Beeb's strong point. You probably thought that the only music you were likely to produce would be something akin to the repetitive overtures so popular in games. But times change and the computer revolution has come to electronic music as well: there is now a world standard which enables you to produce high quality music – MIDI.

What is MIDI?

MIDI stands for Musical Instrument Digital Interface. It is a standard which specifies both hardware – a serial interface – and the software – the protocol needed to enable communication between electronic musical instruments. The software is designed to enable any two MIDI-equipped musical instruments to talk to each other at least at a basic level. In general, MIDI allows one 'master' instrument to control the workings of other 'slaves', the MIDI input effectively replacing the fingers on the slave's keyboard, plectrum on strings or whatever. You can control a drum machine by tapping on a keyboard for example.

MIDI is a digital standard, and one of the best ways of manipulating digital information is by computer – for example the BBC micro. But the MIDI serial interface runs at 31.25 kilobaud, nearly twice as fast as the BBC serial port's highest speed. So how can you use MIDI with a BBC micro?

UMI is a system which enables you to use your BBC as a MIDI controller. There is a small hardware box which acts as the interface between the 1 MHz bus and user port and the five-pin DIN sockets of the MIDI world, plus system software supplied on a ROM. Once the two ribbon cables and the ROM are installed, all it needs is a *UMI command to get going. Then the micro can communicate with your MIDI instruments, can gather data from them and send them commands to play notes.



Musical structures

Stop and think about music itself. You need some idea of what you want from a system designed to control music. The first thing that springs to mind is that music seems to have many things happening at once – drums, bass, vocals and other instruments all have separate parts, but they usually occur at specified times – on beats. There is also a structure to most music – there are repeats of verses or choruses, and classical music often seems to develop in a mathematical sort of way.

It seems as if you would need a system capable of controlling several musical events at once or in parallel. Most computer languages work sequentially, carrying out one instruction after another, and so parallel events aren't common.

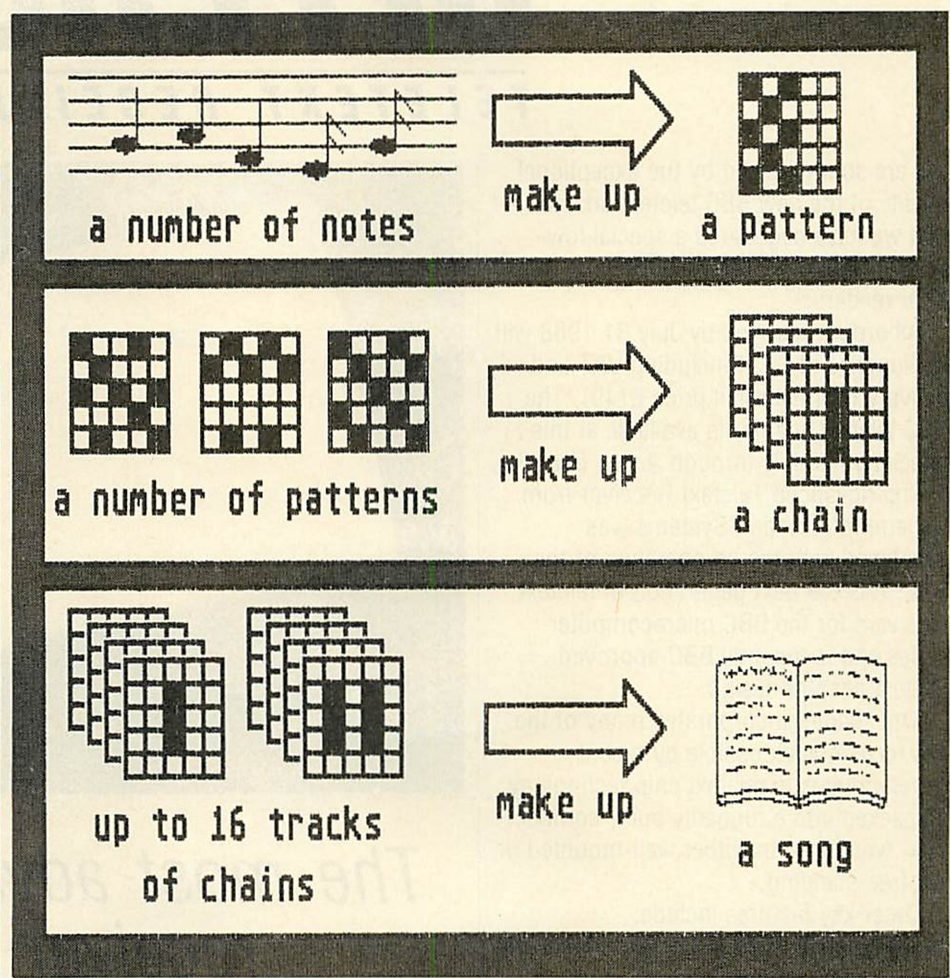
UMI keeps all these parallel strands of music simple. You can record melodies or phrases and then play them back. Using an analogy with drum machines, these sections of music are called patterns. You can have a maximum of 127 patterns, and bearing in mind the repetitive nature of music, this is easily adequate – much like using procedures in Basic, the simple ones can be reused and built into many complete structures. Each pattern can be as short as one beat or as long as 255 beats, so you can work on phrases of any size you want. Usually a pattern length based on the number of beats in a bar, say eight or 16 beats, is a good choice, and there are steps in between the beats for finer detail. Most usually, a pattern will contain the notes for one instrument for a bar or two.

There are two methods of inputting the music into a pattern; real-time and step-time. Real-time is a 'tape recorder' emulation, with the advantage of instant 'tape' rewind. All you do is play the notes on your MIDI keyboard – and the BBC micro stores them and can replay them at will. You can even overdub continuously as you record, adding new sounds to what you've already got, making the building up of complex patterns easy and quick. If you do not like what you have recorded, it is easy to re-record with a single key press. Step-time gives more precise control over what happens, because you enter each event individually. So you would play a note, chord or rest, decide on its length, and then move

on to the next event. Step-time allows you to enter very complex sequences of notes into patterns, as well as giving very precise control over when the notes happen.

You now have a pattern recorded and want to play it back. This is where some of the parallelism comes into action. Suppose that the pattern you have recorded is a bass sequence common to large parts of the music. You can play this back, and use it as a guide as you record new patterns in real-time. This process could then be repeated, monitoring the bass sequence and recording patterns for other instruments.

You can play back as many patterns at once as you wish, but the essence of music is to hear how they sound when played back in a particular order. This is where you use the next level up in UMI's structure: you can assemble 'chains' of patterns, which will then play back in the order you have specified. The UMI software provides 16 separate parallel 'tracks', each of which can play a different sequence of patterns. Each track can be assigned to any one of up to 16 MIDI-equipped musical instruments. The first track, track A, is normally used as the reference track, and can control repetitions of the patterns, providing for very complex ordering possibilities.



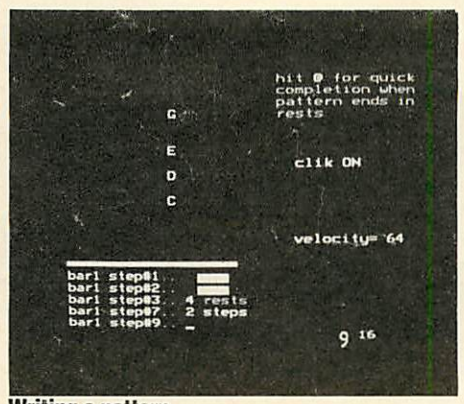
Using UMI you build notes into patterns, patterns into chains and chains into your final song

Storing your songs

Once you have recorded your patterns and organised them into chains, and ultimately a song, you will need to save them. UMI uses floppy discs to store either patterns or chain data, and has facilities to use the disc as a voice file librarian for synthesisers.

This means that the BBC micro can store data on the type of sound produced by the keyboards, whether a 'twang' or a 'beep', analogous the ENVELOPE data of the micro's internal sound system. But each instrument has a different format for the voice data – so far the Yamaha DX7 and Roland D-50, JX-10 and MKS-80 models are catered for, with support for more under development.

If you play back your composition, then there will always be little improvements you can make. UMI has two music editors. One is a simple means of making quick changes to patterns, and the optional micro-editor is a precise means of getting at things on a single event level. You tend to use the quick editor to tidy up patterns as you record them, and leave the fine detail of the micro-editor until later. Editing in a musical context implies rather more than just changing a few notes, and UMI provides a large number of functions designed to provide meaningful changes to the often large amounts of data which are produced by MIDI-based music.



Writing a pattern

Professional system

The UMI hardware and software is a comprehensive and well thought out means of producing complex music to very high, even professional, standards. But don't let this put you off, rather think of it as giving you an easy-to-use, powerful tool with many facilities. UMI has gone through many stages of refinement over several years. The 4M model is the latest version – I found no serious bugs in the software and thoroughly enjoyed using it. It offers a complete composition and music programming environment. You record and edit patterns, assemble them into tracks and play back the completed song, all within UMI. Speed of operation has been an important part of the design, and so there are often short cuts for experienced users. The re-recording of a pattern is particularly easy, as is transposing a pattern within a chain.

All of the program is in ROM, so there is no disc loading of overlays or segments, and all the available RAM can be used for storing patterns – and UMI makes the most of the RAM by using mode 7.

Most of the important information is audible, of course, so the screens can be simple and uncluttered. This makes UMI quick and easy to use, once you have learnt a few of the key commands. While you are learning, there is a disc-based help facility which makes initial composition easy. You can expect all the effort you put into learning to be reflected in the final output, so it really is worth getting to know UMI!

UMI-4M costs £322 for the basic package. The micro-editor is available as an additional ROM for £138. Umusic, 17 Parkfields, London SW15 6NH. Tel: 01-788 3729.

OFFERS

TELETEXT RECEIVER

We are so impressed by the exceptional quality of the new BBC teletext adapter that we have negotiated a special low-price introductory offer exclusive to *Acorn User* readers.

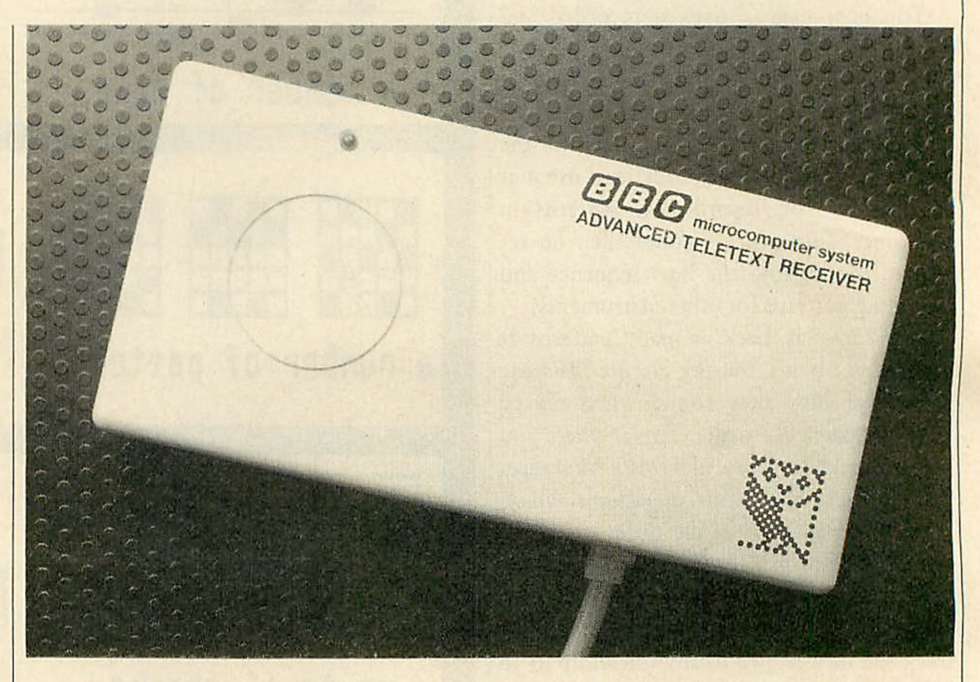
All orders received by July 31 1988 will be supplied at £134 including VAT and delivery (normal retail price £149). The BBC teletext adapter is available at this special price only through *Acorn User*.

The Advanced Teletext Receiver from General Information Systems was developed with the co-operation of the BBC. It is the next generation of teletext receivers for the BBC microcomputer series and is the only BBC-approved teletext adapter design.

The adapter incorporates many of the advances made possible by recent developments in teletext chip technology all packed into a ruggedly built, compact box, which can be either wall-mounted or left free-standing.

Other key features include:

- Complete access to Ceefax, Oracle and free downloadable software.
- Connection to the user port of the BBC models B, B+ and the Master 128.
- Powered by the micro's 5v output.
- The only receiver with *ATS Plus* ROM and on-board dedicated microprocessor for superior performance. The ROM is supplied with a function key strip and excellent user guide.
- The software supplied with the receiver is guaranteed to operate with BBC transmissions.
- Tuning of the receiver is achieved using simple star commands.
- If you are using teletext for a period of time the terminal has the ability to keep pages for you, updating them when new data becomes available.
- Designed for the future: the receiver offers upwards compatibility to full page teletext and picture quality teletext.



The most advanced teletext receiver available



The BBC is committed to developing its telesoftware and has already made a large amount of public domain software available to its users.

You can also use the receiver's *ATS Plus* ROM commands in your own programs to extract data from the teletext pages to build a personal database of information. So you could keep track of the fortunes of your favourite football team, for example, or automatically check up on the state of your share portfolio – you could even build a system that monitored the market, and then warned you of changes.

We are pleased to accept official educational orders, and educational discounts are available for orders of five or more: for more information telephone 01-490 1444 Ext 297.

Please send me

______Advanced Teletext Receiver(s) at £134.00 inclusive of VAT and delivery.

NB: educational discounts are available – contact Seran at *Acorn User*.

I enclose a cheque/postal order for £_____made payable to **GIS (Reader Account)**.

Please charge my Access/American Express £ ____

Official order number __________

ACCOUNT NUMBER ☐☐☐☐ ☐☐☐☐ ☐☐☐☐ ☐☐☐☐ EXPIRY DATE ☐☐☐☐

NAME __________

ADDRESS __________

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SIGNED __________ DATE __________

Please send this coupon with your remittance to **Teletext Offer, *Acorn User* Merchandising, 20-26 Brunswick Place, London N1 6DJ.**

AUTOMATIC WRITING

Once you understand *InterWord*'s layout codes, you can write Basic programs to create wordprocessor files

Alan Archer

A wordprocessor such as *InterWord* can be very useful in preparing weekly news-sheets. News-sheets and circulars can be particularly time consuming. In my particular case, much of the material in our parish news-sheet is repetitive, appearing at regular intervals. Much of the front page is from the Alternative Service Book, readings required by the congregation for the next Sunday's worship. The back page, a list of forthcoming services, always has the same format. The time-consuming element is typing in the material, and especially laying it out in tabulated form. As this form is regular, the process can be speeded up by using a Basic program to generate the wordprocessor file. The readings for the front page are more complex, but they too can be generated automatically by drawing the data from a database file containing all the readings for a two-year cycle of services.

Both these programs produce *InterWord* files, so that the data can be combined with the normal text of the centre pages of the news-sheet. To do this, you need to understand how *InterWord* stores its data, and the specific layout codes used to generate underlines, indents and embedded characters. If the Basic program is written correctly, it can do all of this, so there'll be no editing to do.

The DFS's *DUMP command allows a disc file to be examined byte by byte. So any *InterWord* file can be looked at, and the control codes used can be discovered. There are three ways of saving text from *InterWord*'s main menu. Option 8 allows you to spool text, but this converts all the layout codes to suitable spaces and printer control codes. So *DUMP tells you nothing about how *InterWord* stores the layout codes. Menu option 1 saves the whole text, and stores all the layout codes. But there also over 500 bytes of preliminary data, which contain all your preferences and default setup. The best way of saving data for *DUMP is to use option 3, a marked save. This saves just the text between two markers. Then you have a short file that can easily reveal the layout codes *Interword* uses.

```
*DUMP temp
0000 0D C8 65 72 65 20 69 73 ..ere is
0008 20 61 6E 20 65 78 61 6D  an exam
0010 70 6C 65 2E 20 54 68 69 ple. Thi
0018 73 20 73 68 6F 72 74 20 s short
0020 F0 61 72 61 67 72 61 70 .aragrap
0028 68 20 69 73 20 6D 61 72 h is mar
0030 6B 65 64 2C 20 73 61 76 ked, sav
0038 65 64 20 61 6E 64 20 74 ed and .
0040 68 65 6E 20 F4 68 65 0D hen the.
0048 2A 44 55 4D 50 20 69 73 *DUMP is
0050 20 70 72 69 6E 74 65 64  printed
0058 20 6F 75 74 2E 0D ** ** out..
```

Figure 1. An *InterWord* file examined by *DUMP

Figure 1 shows an example. There is only one oddity, but an important one. Almost every byte has the expected ASCII code except bytes 0001 (&C8), 20 (&F0) and 44 (&F4). In each of these cases, the number is &80 more than the required ASCII code - &48 is 'H', &70 is 'p' and &74 is 't'. *InterWord* uses the normal ASCII codes, except when the character is the first on a new line. Then it sets the top bit of the character, in effect adding 128 (&80) to the ASCII code. This allows it to distinguish between a 'soft' Return which may change if the text is reformatted, and a 'hard' Return which marks the end of a paragraph. When printing out text, if *InterWord* encounters a character with the top bit set, it starts a new line then prints the character with the code 128 less. Aside from the new line, 'top-bit-set' codes are generally interchangeable with their lower, normal counterparts.

Using *DUMP, the functions of most other control codes can be discovered. Most are one- or two-byte codes, with just a few exceptions.

Single-byte codes are the simplest. For example, code &09 means 'print the next character at the next Tab marker'. When storing text, *InterWord* can also store the current positions of the markers, and code &0A is used for denoting a single marker in the text. The Return code is used only to

mark 'hard' Returns, at the beginning of a new paragraph.

The most frequently used codes are two-byte sequences. Each of these has a byte before a block of text, and a matching byte following the block. These are used to control the printing style of the text, so for example &0B is used to embolden the following text, and &13 reverts to normal type. A similar pair of codes, &0C and &14 are used to start and stop underlining. There is also a pair to denote a marked section (&0F and &16), although these never appear in a *DUMPed file saved using menu option 3 – because this saves only the text between the markers.

There is only one triplet code, and three codes with four bytes. The triplet is used to force an unconditional new page. *InterWord* stores a &01 byte, followed by the current line number, followed by &87. The last code must be &87, not &07, because the new page must also start on a new line. A conditional new page is set in a similar way, using code &02, followed by the current line number. Then comes a code representing one less than the number of lines needed to accomodate the text on the page. If the number of lines available falls below this threshold, then any following text will be forced onto the next page. The four-byte code is terminated by &87.

Headers and footers are controlled by the other two four-byte codes. These begin with either &1A (headers) or &1C (footers). Head and footer definitions are numbered and stored separately, and the text contains only the old and new index numbers rather than the whole header. In fact, you have to add &20 to the header and footer numbers. This is all terminated by &1B for a header, &1D for a footer.

There are three types of embedded command codes, which send specific printer control codes to the printer, or set operating system or colon commands. For example, to define the embedded printer control code 27,31,13, the *InterWord* text would have to contain &1E, followed by three Return characters and &1F. These three Returns are characteristic of embedded commands, as a star command can be stored in the text with &1E, Return, the text of the command (for example, *CAT), followed by two Returns and &1F. A colon command for the built-in programming language is similar, the text being preceded by two Returns and followed by Return and &1F.

Finally, new rulers can also be written directly into files by a Basic program. This gives you precise control over the format taken by the text when it is printed out by *InterWord*. The structure of the ruler can best be described by looking at the default ruler. This starts with &85 and &86; make sure you don't use &05 and &06 because the ruler takes up two lines on screen, so the two top-bit-set characters are needed to cause new lines and allow enough room. The next three bytes define the left margin for the first line of a paragraph, the right margin, and the main left margin. The main left margin is where most lines start: the first line of a paragraph can be indented or hanging. All of these are stored in terms of character positions along the ruler, minus one. Next in the ruler come two zero bytes, followed by the Tab markers. Again

SUMMARY OF CODES

Dec	Hex	CTRL	Function
0	&80	@	Show new line
1	&01 or &81	A	Force new page
2	&02 or &82	B	Conditional new page
3	&03 or &83	C	Enter page number
4	&04 or &84	D	Enter pause
5	&85	E	Ruler – 1st byte
6	&86	F	Ruler – 2nd byte
7	&87	G	Last byte of code 1, 2 or 5
9	&09 or &89	I	Tab character
10	&0A or &8A	J	Single marker
11	&0B or &8B	K	Bold start
12	&0C or &8C	L	Underline start
13	&0D or &8D	M	Carriage Return (new paragraph)
14	&0E or &8E	N	Dotted start
15	&0F or &8F	O	Marked section start
16	&10 or &90	P	Centred text start
17	&11 or &91	Q	Right-aligned text start
18	&12 or &92	R	Justified text start
19	&13 or &93	S	Bold end
20	&14 or &94	T	Underline end
21	&15 or &95	U	Dotted end
22	&16 or &96	V	Marked section end
23	&17 or &97	W	Centred text end
24	&18 or &98	X	Right-aligned text end
25	&19 or &99	Y	Justified text end
26	&1A or &9A	Z	Change header number – 1st byte
27	&1B or &9B	[	Change header number – last byte
28	&1C or &9C	\	Change footer number – 1st byte
29	&1D or &9D	]	Change footer number – last byte
30	&1E or &9E	^	Embedded '*',':', or printer code – 1st byte
31	&1F or &9F	_	Embedded '*',':', or printer code – last byte

```
                    THE TEAM PARISH OF BRAUNSTONE

                    St. Peter's and St. Crispin's

News-sheet Vol 4. No. 17                               14 Feb. 1988
                      7th Sunday before Easter


This Week's Theme                       Christ the Friend of Sinners


Introductory Sentence
       The Lord is gracious and merciful and his compassion is
over all that he has made.                             Psalm 145.8,9

Collect
       Merciful Lord,
       grant to your faithful people pardon and peace:
       that we may be cleansed from all our sins
       and serve you with a quiet mind;
       through Jesus Christ our Lord.


Psalms
       32 & 119.65-72
```

The end result: an automated news-sheet

these are simply character positions minus one. There can be any number of Tabs, but the list must be ended with &87. *InterWord*'s ruler can be up to 120 characters wide, but there is also a minimum width of 10 characters.

In *InterWord*, you can search for the occurrence of most of these codes using the Search function called with CTRL-G. All you need to do is specify for example "¦E" for the first &85 byte of the ruler — the other ¦ characters are shown in the summary table. This searching doesn't work with the Search and Replace option from the main menu, though.

Once you know what sort of codes you need in an *InterWord* document, it is possible to produce repetitive parts of that document from a Basic program. All the program has to do is send the required textual data and control codes to a disc file using BPUT#. Remember that you can't use PRINT# to send strings, because Basic stores its strings in reverse order in data files, and precedes them with identification codes that *InterWord* doesn't understand. Listings 1 and 2 are examples showing the principles of the method, although clearly any program for a real job would be more complicated.

The first program merely illustrates how to open a new file, then place text into it. The word 'BOLD' is written out by PROCbput, one character at a time. You can't use PRINT# because this reverses the characters in the string. To embolden the text, it is preceded by a 'Start Bold' code, &8B, and followed by an 'End Bold' code, &93. The second program opens a new file and writes out a ruler, complete with a nine-character hanging indent and Tab stops every five places. Finally a piece of text is centred below the ruler. Notice that the first and second programs both use PROCbput – the only difference is that the first version places a Return character at the end of every string, whereas the second allows several strings to be written onto one line. Finally, both programs close their file with CLOSE .

Once you've produced your file, you can load it into *InterWord* using the Load Text at Cursor command, option 4 in the main menu.

Now you can create *InterWord* files from a Basic program both quickly and easily, and you can use all the page layout and formatting features that *InterWord* can offer. Our parish news-sheet can now be written automatically, by a Basic program that requires only today's date as input.

```
 10 REM to print 'BOLD' in bold
 20 :
 30 f%=OPENOUT "FILE"
 40 a$=CHR$(&8B)+"BOLD"+CHR$(&93)
 50 PROCbput(a$,f%)
 60 CLOSE# f%
 70 END
 80 :
 90 DEF PROCbput(str$,ch%)
100 LOCAL I%
110 IF str$="" THEN GOTO 140
120 FOR I%=1 TO LEN(str$)
130 BPUT# ch%, ASC(MID$(str$,I%,1))
140 NEXT
150 BPUT# f%, &0D
160 ENDPROC
```

Listing 1. Simple Basic program for bold text in *InterWord*

```
 10 REM define a 50 character ruler
 20 REM and centred text
 30 :
 40 lmargin%=9
 50 rmargin%=54
 60 indent%=-9
 70 tabs%=5
 80 :
 90 f%=OPENOUT "FILE"
100 BPUT# f%, &85
110 BPUT# f%, &86
120 BPUT# f%, lmargin%+indent%
130 BPUT# f%, rmargin%
140 BPUT# f%, lmargin
150 BPUT# f%, 0
160 BPUT# f%, 0
170 :
180 FOR I%=lmargin%+tabs% TO rmargi
n%-1 STEP tabs%
190 BPUT# f%, I%
200 NEXT
210 :
220 BPUT# f%, &87
230 :
240 BPUT# f%, &90
250 PROCbput("This is centred",f%)
260 BPUT# f%, &17
270 :
280 CLOSE# f%
290 END
300 :
310 DEF PROCbput(str$,ch%)
320 LOCAL I%
330 IF str$="" THEN GOTO 370
340 FOR I%=1 TO LEN(str$)
350 BPUT# ch%, ASC(MID$(str$,I%,1))
360 NEXT
370 ENDPROC
```

Listing 2. Defining a ruler and centring text

GETTING DOWN TO BUSINESS

Using business simulations in the classroom is a good way to help pupils understand both how businesses work and how they use computers

Nick Evans

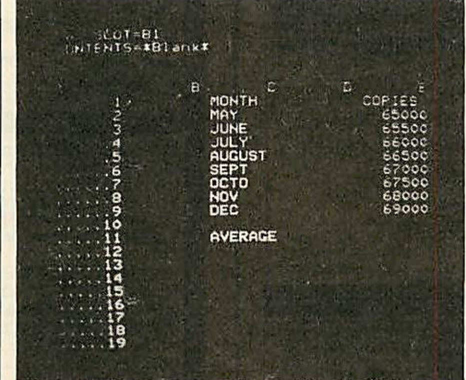
The business studies department of most secondary schools often works closely with the computer studies or IT department; their areas of interest overlap. This is because data processing applications form a large part of both syllabuses.

You might expect business studies to be dealing with computer use at a practical and case study level, but most of the GCSE IT syllabuses also have a practical case study examining industrial applications. The Southern Examining Group syllabus for 1987/8 uses a supermarket till and stock control simulation, the Northern Examining Association has a personnel monitoring system case study and the Midlands Examining Group studies the operation of the DVLC in Swansea.

In the recent moves towards integrating computers and information technology into the wider curriculum, this area is one where success will be easiest. Many IT co-ordinators, whose brief it is to integrate IT into the curriculum, are drawn from business studies teaching because they are so closely linked. This article examines a couple of areas of compatibility and some of the teaching materials available.

It is widely accepted that secondary cross-curricular activity is best undertaken on the same basis as primary 'topic' teaching. The topic work approach assumes that the area of study crosses a number of curricular boundaries. In the study of a trading operation then, it should be possible to look at a number of issues; stock control, till operation, staff monitoring and accounts, for example. This particular set relates specifically to the use of computers in retail management.

Other more general issues are also involved; financial planning, credit card use



***Micros in Business*: cut down *View* family**

from the store's and the customer's viewpoint, advertising and display techniques and personnel management.

With the second set of areas an imaginative teacher will enlist the help of other departments within a school. For example, the moral issues raised by the free availability of credit and persuasive marketing techniques can be expanded upon in the humanities department, or the control of personal finances and the budgeting strategies of businesses and corporations can be developed in personal and social development groups. So, too, can the issues relating to personnel management – workers' rights and how they relate to the law. These are all topics which provide fresh insights into a business which are not necessarily emphasised in the business studies course.

Subjects like stock control, however, may be dealt with as part of an integrated theme within the business and computer studies areas. There are many simulations available that allow the user to set up small businesses and steer them through a number of years' trading activities.

One example of this type of material is the *Cement Business Game* from RBRC Software. This package of materials was developed in conjunction with Blue Circle, and involves setting up and running a cement company, looking at all aspects of the business. The aim is to promote forward-planning and an understanding of the consequences of risk-taking in business. The package is group-based – each group manages a separate version of the same company, with a competition to select the most successful. The incentive as far as the pupils are concerned is that this is a dynamic, interactive 'game'. For the teacher, it's a means of putting the pupils into a situation that is as near the real thing as possible.

The package comes complete with a set of players' guides and posters illustrating the cement industry. The game is aimed at sixth form students and those in further and higher education who require this type of business simulation.

At the other end of the spectrum is the excellent *Micros in Business* suite of materials marketed by Acornsoft. These look at the electronic business tools available – wordprocessors, spreadsheets and databases – and provide an overview by using cut-down versions of the *View* family of business applications. These materials have a two-fold purpose – introducing the concepts of basic business tools and their relation to the business operation, and providing a primer to an admittedly old but still widely used set of business tools. Many schools have standardised on the *View* family, and this situation is reinforced in those schools which have installed Master 128s as they come provided with the *View* and *ViewSheet* packages.

The thing which makes *Micros in Business* attractive to both business and computer studies teachers is that the classwork may be biased towards either or both subject areas.





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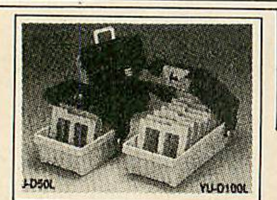
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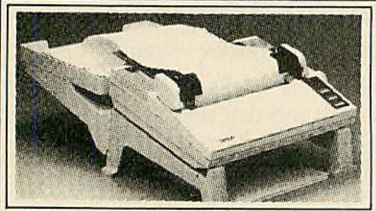
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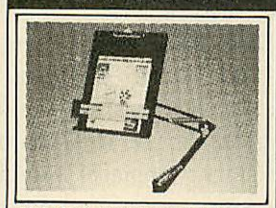
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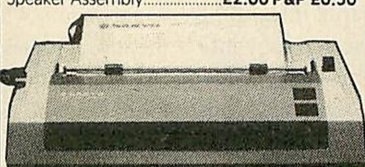
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For example, the package contains a subsection called 'The Small Business Suite', which examines the use of software by a fictitious small building company. At the same time, the spreadsheet, database and wordprocessor sections examine the workings of these tools, their applications to a business, and the ways of getting the best use from them.

One of the most comprehensive business simulations is the MEP's *Business Data Processing*. It includes a simulation – *Leisure Unlimited* – which is also available as a separate product. The whole pack was designed for the GCSE Computer Studies National Criteria, and every local education authority has received a master copy, which may be freely distributed. Sadly, the volume of materials involved makes this hardly practicable. It may be that your LEA computer adviser has copies that are available for loan or purchase. Failing that, packs can be bought from Resource.

The materials comprise readers, case studies, projects and classroom reports, as well as the software tools discs which enable you to string together data processing routines into structures appropriate to a number of business simulations. *Leisure Unlimited* itself is a mail order catalogue simulation which teaches through a series of 'in-tray' exercises. It covers ordering procedures, invoicing, despatch, statements and payments. It simulates the jobs of staff in five main departments – sales, accounts, warehousing, computer operations and customer service. Students role-play these jobs and process orders in a normal day's trading. 'Errors' are designed into the system to provide real-life problems that have to be resolved. All the forms and computer materials needed for the pack are included as copy masters so that the dedicated sets of materials may be made for each group.

GSN's *Mail Order* pack is similar. It is marketed through Mercury Educational Products as part of Granada Television's *Micro at Work* series, for which GSN has produced most of the software. Like *Leisure Unlimited, Mail Order* also simulates a mini-enterprise, in which the structure of the business and content are created by the groups of role-playing pupils. The trading simulation takes place over a fixed period. This package uses the *Key* database described last month in *Acorn User*. The data file already contains a catalogue of some mail-order items which can be extended. Once again,copyable materials are provided.

The problem with any of this type of material is that it rarely relates directly to the children's own lives – and nowadays that's a definite pre-requisite in the primary classroom. The use of second-hand experiences is still acceptable in the secondary school, however, and indeed is often dictated by the nature of the material the children may be handling.



***Cement Business Game* was developed in conjunction with 'real company' Blue Circle**

It is interesting to see a further set of materials which actually relate fairly closely to something which most children have experienced at first hand by the age of 12 or 13 – the fast-food checkout.

Trader from Star Devices provides a simulation of the type of till used when you order your 'quarterpounder with cheese and fries to go'. This uses the Concept Keyboard as its input medium – a device that bears a great resemblance to the tills in fast-food chains. Not only do these tills display the amounts of money about to change hands, they also provide the operator with a visible reminder of the products ordered by the customer, as each item on the menu has a dedicated button.

The till operation covers not only the present transaction but also updates stock and accounts records. The thing this package lacks is a set of curriculum notes. Having said that, it is unlikely that teachers will have any difficulty in integrating this type of software into their general syllabus. These programs may be configured to enable exploitation in other ways, presenting a different model of reality. It would be interesting to use them in an actual trading operation within the school – school lunches, a tuck shop or as part of some other enterprise, perhaps.

Finally, an interesting overview of the way your gas bill is arrived at is provided by the *Gas Billing System* from Addison Wesley. It examines all aspects of billing, including connection and dis-connection and its associated moral conflicts, plus the reasons for errors under this type of system. Although the package is designed for GCSE, BTEC and CPVE courses, it will prove valuable within the business studies area too. The pack comprises teacher's book, pupil's book and software.

There is room for much co-operation between computer studies and business studies. A school's particular situation will naturally dictate the extent to which such co-operation can take place. But the almost unique links between the two disciplines in the upper age range of secondary school provides an opportunity for integrated and highly motivating work.

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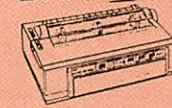
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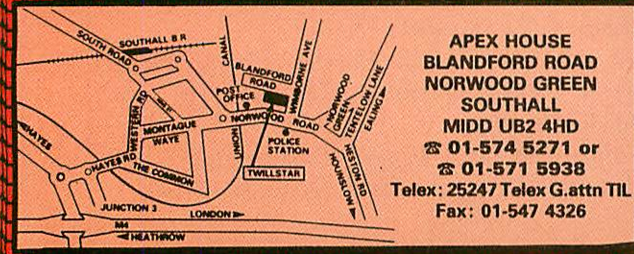
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COMPATIBILITY

Program	Page	BBC B	B+/128	Master 128	Master Compact	Electron	Arc	6502SP/ Turbo	ADFS	Econet	Shadow RAM	Monthly T/D
Step by Step	81											
Listing 1		■	■	■	■			■	■	■	■	■
Listing 2[1]		■	■	■	■		■	■	■	■	■	■
Hints & Tips	82											
Listing 1		■	■	■	■	■		■	■	■	■	■
Listing 2		■	■	■	■	■	■	■	■	■	■	■
Listings 3-4		■	■	■	■	■		■	■	■	■	■
Listing 5		■	■	■	■	■		■	■	■	■	■
Listing 6		■[2]	■[2]	■	■[2]	■[2]		■	■	■	■	■
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Listings 1-2		■	■	■	■			■	■	■	■	■
Listing 3				■	■			■	■	■	■	■
Music	95											
Listing 1[3]		■	■	■				■	■	■	■	■

Notes: [1] Requires *InterChart* [2] Requires RTC [3] Requires Ample Nucleus

STEP BY STEP

See Step by Step, page 37

Listing 1. Link file

```
   10 REM Read and Display V.VS Link File
   20 REM by Bruce Smith
   30 REM for BBC B/B+/M/C
   40 REM (c) Acorn User June 1988
   50 :
   60 MODE 3
   70 PROCsetup
   80 PROCdisplay
   90 CLOSE# ?handle%
  100 END
  110 :
  120 DEF PROCdisplay
  130 PRINT "Reading Information from Link File"''
  140 PRINT TAB(5);"Record";TAB(15);"Income";TAB(25);"Expenditure"
  150 FOR loop=1 TO 12
  160 PRINT TAB(5);loop;
  170 PRINT TAB(15);FNread(handle%,1,loop);
  180 PRINT TAB(25);FNread(handle%,2,loop)
  190 NEXT
  200 ENDPROC
  210 :
  220 DEF PROCsetup
  230 PRINT "ViewSheet Link File Display Utility"''
  240 handle%=FNopen("10")
  250 ENDPROC
  260 :
  270 DEF FNread(f%, x%, y%)
  280 LOCAL n
  290 IF (x%<1) OR (x%>f%?1) THEN PROCerror(1)
  300 IF (y%<1) OR (x%>f%?2) THEN PROCerror(2)
  310 PTR# ?f%=6*((y%-1)*f%?1+x%)
  320 INPUT# ?f%,n
  330 =n
  340 :
  350 DEF FNopen(file$)
  360 LOCAL f%
  370 DIM f% 2
  380 PRINT "Opening V.VS";file$
  390 ?f%=OPENIN("V.VS"+file$)
  400 IF ?f%=0 THEN PROCerror(3)
  410 PTR# ?f%=5
  420 IF BGET# ?f%<>&AA THEN PROCerror(4)
  430 PTR# ?f%=3
  440 f%?2=BGET# ?f%
  450 f%?1=BGET# ?f%
  460 =f%
  470 :
  480 DEF PROCerror(number%)
  490 IF number%=0 THEN REPORT
  500 IF number%=1 THEN PRINT "x parameter too big"
  510 IF number%=2 THEN PRINT "y parameter too big"
  520 IF number%=3 THEN PRINT "Sorry - no such file!"
  530 CLOSE# 0
  540 END
```

See Hints & Tips, page 31

Listing 1. Lotus menus

```
   10 REM Lotus Menu
   20 REM by Graham Crow
   30 REM for B/B+/E/M/C
   40 REM (c) Acorn User June 1988
   50 :
   60 MODE 0
   70 ON ERROR PROCerr
   80 PROCinit
   90 REPEAT
  100 PROCprog
  110 UNTIL quit%
  120 END
  130 :
  140 DEF PROCerr
  150 IF ERR=17 VDU 28,0,Y%+2,79,Y%,12,2
6:GOTO 90
  160 CLS
  170 REPORT
  180 PRINT " at line ";ERL
  190 *FX 4
  200 *FX 229
  210 VDU 23,1,1;0;0;0;
  220 END
  230 ENDPROC
  240 :
  250 DEF PROCinit
  260 M%=15
  270 DIM menu$(M%),sub$(M%),place%(M%)
  280 FOR J%=1 TO M%
  290 menu$(J%)=STRING$(15,"*")
  300 NEXT
  310 FOR J%=1 TO M%
  320 sub$(J%)=STRING$(60,"*")
  330 NEXT
  340 X%=3:Y%=0
  350 init$=STRING$(M%,"*")
  360 quit%=FALSE
  370 line$=STRING$(79,"=")
  380 PRINT TAB(0,3)line$ TAB(0,29)line$
  390 ENDPROC
  400 :
  410 DEF FNmenu
  420 VDU 23,1,0;0;0;0;
  430 *FX 4,1
  440 VDU 28,0,Y%+2,79,Y%,12,26
  450 COLOUR 129:COLOUR 0
  460 PRINT TAB(73,Y%+2)" MENU "
  470 COLOUR 128:COLOUR 1
  480 :
  490 VDU 31,X%,Y%
  500 FOR J%=1 TO N%
  510 PRINT menu$(J%)" : ";
  520 NEXT
  530 :
  540 PRINT TAB(X%,Y%+1) sub$(1)
  550 :
  560 COLOUR 129:COLOUR 0
  570 PRINT TAB(X%,Y%) menu$(1)
  580 COLOUR 128:COLOUR 1
  590 :
  600 init$=""
  610 FOR J%=1 TO N%
  620 init$=init$+LEFT$(menu$(J%),1)
  630 NEXT
  640 :
  650 pos%=X%
  660 FOR J%=1 TO N%
  670 place%(J%)=pos%
  680 pos%=pos%+LEN(menu$(J%))+3
  690 NEXT
  700 :
  710 item%=1
  720 escape%=FALSE
  730 *FX 229,1
  740 :
  750 REPEAT
  760 rem%=item%
  770 REPEAT
  780 *FX 15
  790 G%=GET
  800 I%=INSTR(init$,CHR$(G%))
  810 UNTIL G%=13 OR G%=136 OR G%=137 OR
 G%=27 OR I%>0
  820 :
  830 IF G%=13 OR G%=27 THEN 990
  840 IF I%>0 item%=I%:GOTO 880
  850 IF G%=137 item%=item%+1:IF item%>N
% item%=1
  860 IF G%=136 item%=item%-1:IF item%<1
 item%=N%
  870 :
  880 VDU 31,place%(rem%),Y%
  890 COLOUR 128:COLOUR 1
  900 PRINT menu$(rem%)
  910 :
  920 VDU 31,place%(item%),Y%
  930 COLOUR 129:COLOUR 0
  940 PRINT menu$(item%)
  950 :
  960 COLOUR 128:COLOUR 1
  970 PRINT TAB(0,Y%+1)SPC(79) TAB(X%,Y%
+1)sub$(item%)
  980 :
  990 UNTIL G%=13 OR G%=27 OR I%>0
 1000 IF G%=27 escape%=TRUE ELSE G%=item
%
 1010 *FX 229
 1020 VDU 23,1,1;0;0;0;
 1030 *FX 4
 1040 =G%
 1050 :
 1060 DEF PROCmainmenu
 1070 N%=7
 1080 RESTORE 1140
 1090 FOR J%=1 TO N%
 1100 READ n$,d$
 1110 menu$(J%)=n$
 1120 sub$(J%)=d$
 1130 NEXT
 1140 DATA Chart,Enter window on family
tree
 1150 DATA File,Save or Load database
 1160 DATA Edit,Create or Edit data
 1170 DATA Link,Link individual by marri
age or parentage
 1180 DATA Report,Reports and Enquiries
menu
 1190 DATA Printer,Configure and enable
printer
 1200 DATA Quit,Leave program and return
 to BASIC
 1210 sel%=FNmenu
 1220 IF escape% VDU 28,0,Y%+2,79,Y%,12,
26:ENDPROC
 1230 IF sel%=7 quit%=TRUE:ENDPROC
 1240 IF sel%=5 PROCreportsmenu ELSE PRO
Caction
 1250 ENDPROC
 1260 :
 1270 DEF PROCreportsmenu
 1280 N%=5
 1290 RESTORE 1350
 1300 FOR J%=1 TO N%
 1310 READ n$,d$
 1320 menu$(J%)=n$
 1330 sub$(J%)=d$
```

Continued ►

◀ Hints & Tips listing 1 continued

```
1340 NEXT
1350 DATA Anscestors,Print ancestor cha
rt
1360 DATA Descendants,Print descendant
chart
1370 DATA Search,Menu of search options
1380 DATA Table,Produce printed table o
f all members by name and number
1390 DATA Relative,Search for specified
relatives
1400 sel%=FNmenu
1410 IF escape% PROCmainmenu:ENDPROC
1420 IF sel%=3 PROCsearchmenu ELSE PROC
action
1430 ENDPROC
1440 :
1450 DEF PROCsearchmenu
1460 N%=2
1470 RESTORE 1530
1480 FOR J%=1 TO N%
1490 READ n$,d$
1500 menu$(J%)=n$
1510 sub$(J%)=d$
1520 NEXT
1530 DATA Name,Search according to name
(or partial name)
1540 DATA Condition,Search according to
condition
1550 sel%=FNmenu
1560 IF escape% PROCreportsmenu ELSE PR
OCaction
1570 ENDPROC
1580 :
1590 DEF PROCprog
1600 VDU 28,0,28,79,10,12,26
1610 COLOUR 129:COLOUR 0
1620 PRINT TAB(70,Y%+2)" PROGRAM "
1630 COLOUR 128:COLOUR 1
1640 PRINT TAB(3,10)"APPLICATION PROGRA
M"TAB(3,11)"-------------------"
1650 PRINT TAB(3,13)"To invoke the stru
ctured menu system, press /"
1660 PRINT TAB(3,15)"WHEN IN THE MENUS,
THE FOLLOWING ACTIONS APPLY:"
1670 PRINT TAB(3,17)"Left & right arrow
s move highlighted bar"
1680 PRINT TAB(3,18)"Selection is by RE
TURN or initial letter"
1690 PRINT TAB(3,19)"ESCAPE takes you b
ack to next higher level"
1700 PRINT TAB(3,20)"The lower line des
cribes the highlighted item"
1710 PRINT TAB(3,22)"PRESS / TO CALL UP
THE MAIN MENU ";
1720 REPEAT UNTIL GET=47
1730 PROCmainmenu
1740 ENDPROC
1750 :
1760 DEF PROCaction
1770 COLOUR 129:COLOUR 0
1780 PRINT TAB(70,Y%+2)" PROGRAM "
1790 COLOUR 128:COLOUR 1
1800 PRINT TAB(X%,Y%+2)"CARRY OUT APPRO
PRIATE ACTION";
1810 PRINT " - Press space bar ";
1820 REPEAT UNTIL GET=32
1830 VDU 28,0,Y%+2,79,Y%,12,26
1840 ENDPROC
```

Listing 2. Music sheet printer

```
10 REM Manuscript printer
20 REM by Terry Blunt
30 REM for B/B+/E/M/C/A & Epson print
er
40 REM (c) Acorn User June 1988
50 :
60 ON ERROR PROCerror
70 MODE 7
80 PRINT TAB(2,4) "This program print
s plain musical"
90 PRINT "stave lines on standard 'A4
paper."
100 PRINT TAB(2,7) "The program will o
perate with any"
110 PRINT "EPSON compatible printer."
120 REPEAT
130 PRINT TAB(2,11) SPC(38) CHR$11;
140 INPUT "Number of sheets to print?
" sheets%
150 UNTIL sheets%>0
160 empty%=FNspace
170 :
180 FOR count%=1 TO sheets%
190 VDU 2
200 FOR test%=1 TO 3
210 VDU 1,0
220 NEXT
230 VDU 3
240 PRINT TAB(5,13) CHR$(136) "Printer
is off line" CHR$13;
250 REPEAT
260 UNTIL FNspace=empty%
270 *FX 15,1
280 PRINT "Insert sheet "; count% " an
d hit a key";
290 IF GET PRINT
300 VDU 2
310 VDU 1,27,1,65,1,7
320 :
330 FOR stave%=1 TO 12
340 FOR line%=1 TO 5
350 FOR char%=1 TO 80
360 VDU 1,95
370 NEXT char%
380 NEXT line%
390 FOR blank%=1 TO 5
400 VDU 1,10
410 NEXT blank%
420 NEXT stave%
430 :
440 VDU 1,12
450 VDU 3
460 NEXT count%
470 PRINT CHR$(11) "Finished printing.
" SPC22
480 END
490 :
500 DEF PROCerror
510 VDU 3
520 REPORT
530 PRINT " at line "; ERL
540 END
550 ENDPROC
560 :
570 DEF FNspace
580 A%=&80
590 X%=&FC
600 Y%=&FF
610 =(USR &FFF4 AND &FFFFFF) DIV &100
```

Listing 3. Mode 7 compressor

```
10 REM Mode 7 Screen Compressor
20 REM by V J Spanner
30 REM for B/B+/M/C
40 REM (c) Acorn User June 1988
50 :
60 MODE 7
70 INPUT "Screen to compress : " f1$
80 INPUT "Save compressed file as : " f2$
90 MODE 7
100 PROCoscli("LOAD "+f1$+" FFFF7C00")
110 X=OPENOUT(f2$)
120 times%=0:value%=?&7C00:bytes%=0
130 FOR screen%=&7C00 TO &7FFF
140 IF ?screen%<>value% OR times%=255 THEN BPUT# X,value%:BPUT# X,times%:times%=0 ELSE times%=times%+1
150 value%=?screen%
160 NEXT
170 bytes%=EXT# X
180 CLOSE# X
190 CLS
200 PRINT "Screen saved as " f2$
210 PRINT 1023-bytes%;" bytes saved"
220 END
230 :
240 DEF PROCoscli($&700)
250 LOCAL X%,Y%:Y%=7
260 CALL &FFF7
270 ENDPROC
```

Listing 4. Mode 7 expander

```
10 REM Mode 7 Screen DeCompressor
20 REM by V J Spanner
30 REM for B/B+/M/C
40 REM (c) Acorn User June 1988
50 :
60 MODE 7
70 INPUT "Filename to decompress : " f$
80 MODE 7
90 X=OPENIN(f$)
100 start%=&7BFF
110 REPEAT
120 value%=BGET# X
130 times%=BGET# X
140 FOR D%=start% TO start%+times%
150 ?D%=value%
160 NEXT
170 start%=start%+times%+1
180 UNTIL EOF# X
190 CLOSE# X
200 A=GET
210 END
```

Listing 5. Case converter

```
1 REM Upper to lower
2 REM by Roger Stark
3 REM for B/B+/E/M/C
4 REM (c) Acorn User June 1988
5 FOR t=PAGE TO LOMEM
6 v=?t
7 IF v=&0D THEN PRINT?(t+2)+(?(t+1)*256):t=t+3:GOTO 14
8 IF v=34 THEN REPEAT t=t+1:UNTIL ?t=34 OR ?(t+1)=&0D:GOTO 14
9 IF v=&DC OR v=&F4 THEN REPEAT t=t+1:UNTIL ?(t+1)=&0D:GOTO 14
```

Continued ►

◄ Hints & Tips listing 5 continued

```
10 IF v=&8D THEN t=t+3:GOTO 14
11 IF v=38 THEN REPEAT t=t+1:UNTIL ?t<47 OR (?t>57 AND ?t<65) OR ?t>92:t=t-1:GOTO 14
12 IF v>64 AND v<92 AND ?(t+1)<>37 THEN ?t=v+32
13 IF v=37 AND (?(t-2)>96 AND ?(t-2)<123) AND (?(t-1)>64 AND ?(t-1)<96) THEN ?(t-1)=?(t-1)+32
14 NEXT
15 END
```

Listing 6. Datestamper

```
10 REM Program Datestamper
20 REM by G K Davis
30 REM for Master or B/B+/E/C with RTC
40 REM (c) Acorn User June 1988
50 :
60 PROCclearmem
70 PROCassemble
80 PROCchecksum
90 PROCsavecode
100 END
110 :
120 DEF PROCclearmem
130 FOR I%=&A00 TO &A2F
140 ?I%=0
150 NEXT I%
160 ENDPROC
170 :
180 DEF PROCassemble
190 code%=&A00
200 FOR pass=0 TO 3 STEP 3
210 P%=code%
220 [OPT pass
230 LDA #0
240 STA buffer
250 LDA #14
260 LDX #buffer MOD 256
270 LDY #buffer DIV 256
280 JSR &FFF1
290 LDX #255
300 .insert
310 INX
320 LDA remstring,X
330 PHA
340 STX store
350 TAY
360 LDX #0
370 LDA #138
380 JSR &FFF4
390 LDX store
400 PLA
410 CMP #&D
420 BNE insert
430 RTS
440 .remstring
450 OPT FNequs("OREM ")
460 .store
470 OPT FNequb(0)
480 .buffer
490 ]
500 NEXT
510 ENDPROC
520 :
530 DEF PROCchecksum
540 C=0
550 FOR I%=&A00 TO &A2F
560 C=C+?(I%)
```

Continued ►

◀ **Hints & Tips listing 6 continued**

```
570 NEXT I%
580 IF C<>5176 THEN PRINT "Check listi
ng.":END
590 ENDPROC
600 :
610 DEF PROCsavecode
620 PRINT "Press SPACE to save code"
630 REPEAT UNTIL GET=32
640 *SAVE STAMP FFFF0A00+2B
650 ENDPROC
660 :
670 DEF FNequb(b%)
680 ?P%=b%
690 P%=P%+1
700 =pass
710 :
720 DEF FNequs(b$)
730 $P%=b$
740 P%=P%+LEN(b$)
750 =pass
```

Listing 7. Ignore printer codes

```
10 REM Printer Ignore Control
20 REM by Robin Burton
30 REM for B/B+/E/M/C
40 REM (c) Acorn User June 1988
50 :
60 osbyte=&FFF4
70 wrchv=&20E
80 oldvec=&ACB
90 S%=&900
100 :
110 PROCclearmem
120 PROCassemble
130 PROCchecksum
140 PROCsavecode
150 PRINT'"On/off flag is at &";~ignfl
ag
160 END
170 :
180 DEF PROCclearmem
190 FOR I%=&900 TO &98A
200 ?I%=0
210 NEXT I%
220 ENDPROC
230 :
240 DEF PROCassemble
250 FOR pass=0 TO 3 STEP 3
260 P%=S%
270 [OPT pass
280 .vecset
290 LDA wrchv
300 STA oldvec
310 LDA wrchv+1
320 STA oldvec+1
330 LDA #newvec MOD 256
340 LDX #newvec DIV 256
350 SEI
360 STA wrchv
370 STX wrchv+1
380 CLI
390 LDA oldig+1
400 BEQ newig
410 STA oldig
420 RTS
430 :
440 .newig
450 LDA #&F6
460 LDX #0
470 LDY #&FF
```

Continued ▶

◀ **Hints & Tips listing 7 continued**

```
480 JSR osbyte
490 DEX
500 STX oldig
510 STX oldig+1
520 RTS
530 :
540 .newvec
550 STA chr
560 PHP
570 PHA
580 TXA
590 PHA
600 TYA
610 PHA
620 :
630 LDA #&75
640 JSR osbyte
650 TXA
660 AND #1
670 BEQ output
680 :
690 LDX chr
700 LDA ignflag
710 BEQ setignore
720 CMP #2
730 BNE stdignore
740 :
750 DEX
760 CPX oldig
770 BEQ force
780 INX
790 JMP setignore
800 :
810 .force
820 LDA #3
830 JSR oswr
840 LDA chr
850 JSR oswr
860 LDA #2
870 JSR oswr
880 PLA
890 TAY
900 PLA
910 TAX
920 PLA
930 PLP
940 RTS
950 :
960 .stdignore
970 LDX oldig
980 .setignore
990 LDA #6
1000 INX
1010 JSR osbyte
1020 :
1030 .output
1040 PLA
1050 TAY
1060 PLA
1070 TAX
1080 PLA
1090 PLP
1100 .oswr
1110 JMP (oldvec)
1120 :
1130 .oldvec
1140 BRK
1150 BRK
1160 :
1170 .chr
1180 BRK
1190 :
1200 .ignflag
```

Continued ▶

◄ Hints & Tips listing 7 continued

```
1210 OPT FNequb(0)
1220 :
1230 .oldig
1240 BRK
1250 OPT FNequb(9)
1260 ]
1270 NEXT
1280 ENDPROC
1290 :
1300 DEF PROCchecksum
1310 T%=0
1320 FOR C%=S% TO chr
1330 T%=T%+?C%
1340 NEXT
1350 IF T%<> 14058 PRINT "Code has erro
rs":END
1360 ENDPROC
1370 :
1380 DEF PROCsavecode
1390 S$=STR$~S%
1400 L%=P%-S%
1410 L$=STR$~L%
1420 A$="*SAVE IGNSWCH "+S$+"+"+L$+" "+
S$
1430 PRINT "Press SPACE to save code"
1440 REPEAT UNTIL GET=32
1450 PROCoscli(A$)
1460 ENDPROC
1470 :
1480 DEF FNequb(b%)
1490 ?P%=b%
1500 P%=P%+1
1510 =pass
1520 :
1530 DEF PROCoscli(string$)
1540 DIM X% &FF
1550 Y%=X% DIV 256
1560 $X%=string$
1570 CALL &FFF7
1580 ENDPROC
```

See Arc Agora, page 34

Listing 1. In-betweening

```
10 REM Arc Agora - listing 1
20 REM In-betweening
30 REM by Dave Lawrence
40 REM for Archimedes only
50 REM (c) Acorn User June 1988
60 :
70 MODE 8
80 OFF
90 DIM start(100,1),end(100,1),step(1
00,1),type(100)
100 type()=5
110 *POINTER 1
120 MOUSE ON 1
130 PROCinput(start(),100,1,n)
140 PROCinput(end(),n,2,fred)
150 MOUSE OFF
160 INPUT "How many stages ";n%
170 step()=end()-start():step()=step()
/n%
180 bank%=1
190 REPEAT
200 FOR move%=0 TO n%
210 WAIT
220 SYS "OS_Byte",112,bank%
230 SYS "OS_Byte",113,3-bank%
240 bank%=3-bank%
250 PROCshape(move%)
260 NEXT
270 FOR move%=n%-1 TO 1 STEP -1
280 WAIT
290 SYS "OS_Byte",112,bank%
300 SYS "OS_Byte",113,3-bank%
310 bank%=3-bank%
320 PROCshape(move%)
330 NEXT
340 UNTIL FALSE
350 :
360 DEF PROCshape(m%)
370 CLS
380 FOR p%=0 TO n-1
390 PLOT type(p%),start(p%,0)+m%*step(
p%,0),start(p%,1)+m%*step(p%,1)
400 NEXT
410 ENDPROC
420 :
430 DEF PROCinput(RETURN a(),m%,c%,RET
URN t)
440 t=0
```

Continued ►

◄ Arc Agora listing 1 continued

```
450 type=0
460 REPEAT
470 MOUSE x,y,but
480 IF type=1 AND type(t)=5 THEN
490 GCOL 3,c%
500 MOVE x%,y%
510 DRAW x,y
520 DRAW x%,y%
530 ENDIF
540 IF but=2 OR but=4 THEN
550 a(t,0)=x
560 a(t,1)=y
570 type2=type(t)
580 IF c%=1 THEN
590 IF (but=2 OR type=0) THEN
600 type(t)=4
610 ELSE
620 type(t)=5
630 ENDIF
640 ENDIF
650 t+=1
660 IF type=1 AND but=4 AND type2=5 TH
EN
670 GCOL 0,c%
680 PLOT type(t),x%,y%
690 DRAW x,y
700 ENDIF
710 x%=x
720 y%=y
730 type=1
740 REPEAT
750 MOUSE x,y,b
760 UNTIL b<>but
770 ENDIF
780 UNTIL (but=1 AND c%=1) OR (t=m% AN
D c%=2)
790 ENDPROC
```

Listing 2. Sprite animation

```
10 REM Arc Agora - listing 2
20 REM Sprite Animation
30 REM by Dave Acton
40 REM for Archimedes only
50 REM (c) Acorn User June 1988
60 :
```

Continued ►

◀ Arc Agora listing 2 continued

```
 70 MODE 0
 80 VDU 29,640;512;
 90 DIM v(250,1),p(500,3),temp(3)
100 DIM rotatex(3,3),persp(3,3)
110 PROCwineglass
120 scale=100
130 PROCunitmatrix(persp())
140 persp(2,3)=1/8
150 stages%=50
160 FOR step%=0 TO stages%-1
170 CLS
180 PRINT"Frame ";step%
190 RECTANGLE -150,-312,299,623
200 FOR v%=0 TO vector%-1
210 PROCperspective(v(v%,0),4)
220 PROCperspective(v(v%,1),5)
230 NEXT
240 PROCrotatex(360/stages%)
250 MOVE -150,-312
260 MOVE 149,311
270 VDU 23,27,1,step%|
280 NEXT
290 CLS
300 REPEAT
310 FOR step%=0 TO stages%-1
320 VDU 23,27,0,step%|
330 WAIT
340 PLOT &ED,-150,-312
350 NEXT
360 UNTIL FALSE
370 :
380 DEF PROCaddv(x1,y1,z1,x2,y2,z2)
390 v(vector%,0)=FNpnum(x1,y1,z1,1)
400 v(vector%,1)=FNpnum(x2,y2,z2,1)
410 vector%=vector%+1
420 ENDPROC
430 :
440 DEF FNpnum(x,y,z,w)
450 p%=0
460 WHILE p%<point% AND NOT(p(p%,0)=x
 AND p(p%,1)=y AND p(p%,2)=z AND p(p%,3)=
w)
470 p%+=1
480 ENDWHILE
490 IF p%=point% THEN
500 p(point%,0)=x
510 p(point%,1)=y
520 p(point%,2)=z
530 p(point%,3)=w
540 point%+=1
550 ENDIF
560 =p%
570 :
580 DEF PROCperspective(p%,t%)
590 FOR d%=0 TO 3
600 temp(d%)=p(p%,d%)
610 NEXT
620 temp()=temp().persp()
630 PLOT t%,scale*temp(0)/temp(3),scal
e*temp(1)/temp(3)
640 ENDPROC
650 :
660 DEF PROCrotatex(theta)
670 PROCunitmatrix(rotatex())
680 rotatex(1,1)=COSRAD(theta)
690 rotatex(1,2)=SINRAD(theta)
700 rotatex(2,1)=-SINRAD(theta)
710 rotatex(2,2)=COSRAD(theta)
720 PROCapply(rotatex())
730 ENDPROC
740 :
750 DEF PROCapply(m())
760 FOR p%=0 TO point%-1
```

Continued ▶

◀ Arc Agora listing 2 continued

```
 770 FOR d%=0 TO 3
 780 temp(d%)=p(p%,d%)
 790 NEXT
 800 temp()=m().temp()
 810 FOR d%=0 TO 3
 820 p(p%,d%)=temp(d%)
 830 NEXT
 840 NEXT
 850 ENDPROC
 860 :
 870 DEF PROCunitmatrix(RETURN m())
 880 FOR x%=0 TO 3
 890 FOR y%=0 TO 3
 900 m(x%,y%)=-(x%=y%)
 910 NEXT
 920 NEXT
 930 ENDPROC
 940 :
 950 DEF PROCwineglass
 960 point%=0
 970 vector%=0
 980 s%=10
 990 PRINT"Please wait..."
1000 FOR a=0 TO 355 STEP s%
1010 PROCaddv(SINRAD(a),2,COSRAD(a),SIN
RAD(a+s%),2,COSRAD(a+s%))
1020 PROCaddv(0.5*SINRAD(a),0.5,0.5*COS
RAD(a),0.5*SINRAD(a+s%),0.5,0.5*COSRAD(a
+s%))
1030 PROCaddv(SINRAD(a),2,COSRAD(a),0.5
*SINRAD(a),0.5,0.5*COSRAD(a))
1040 PROCaddv(0.5*SINRAD(a),0.5,0.5*COS
RAD(a),0.1*SINRAD(a),0.2,0.1*COSRAD(a))
1050 PROCaddv(0.1*SINRAD(a),0.2,0.1*COS
RAD(a),0.1*SINRAD(a),-1,0.1*COSRAD(a))
1060 PROCaddv(0.7*SINRAD(a),-1,0.7*COSR
AD(a),0.7*SINRAD(a+s%),-1,0.7*COSRAD(a+s
%))
1070 NEXT
1080 ENDPROC
```

Listing 3. Print dump module

```
 10 REM Arc Agora - listing 3
 20 REM PrintMod
 30 REM by Ian Macfarlane
 40 REM for Archimedes only
 50 REM (c) Acorn User June 1988
 60 :
 70 MODE 3
 80 DIM code% &2000
 90 eventv=&10
100 OS_WriteI=&100
110 :
120 FOR pass%=4 TO 7 STEP 3
130 P%=0
140 O%=code%
150 [OPT pass%
160 EQUD printinit
170 EQUD 0
180 EQUD fin
190 EQUD 0
200 EQUD title
210 EQUD help
220 EQUD command
230 :
240 .title
250 EQUS "ScreenPrint"
260 EQUB 0
270 .help
280 EQUS "ScreenPrint"
290 EQUB 9
```

Continued ▶

JOE'S JOTTINGS

◀ Arc Agora listing 3 continued

```
 300 EQUS "0.15 (12 Mar 1988)"
 310 EQUB 0
 320 .command
 330 EQUS "PrintInit"
 340 EQUB 0
 350 ALIGN
 360 EQUD printinit
 370 EQUD 0
 380 EQUD syntaxtext
 390 EQUD helptext
 400 EQUD 0
 410 :
 420 .syntaxtext
 430 EQUS "Syntax: *PrintInit"
 440 EQUB 0
 450 .helptext
 460 EQUS "PrintInit sets up the 'Print
' "
 470 EQUS "button to perform a *HardCop
y."
 480 EQUB 13
 490 EQUB 10
 500 EQUS "Syntax: *PrintInit"
 510 EQUB 0
 520 :
 530 .printinit
 540 MOV R0,#eventv
 550 ADR R1,keyevent
 560 MOV R2,R12
 570 SWI "OS_Claim"
 580 MOV R0,#14
 590 MOV R1,#11
 600 SWI "OS_Byte"
 610 .exit
 620 ADR R0,errormain
 630 SWI "OS_Exit"
 640 :
 650 .errormain
 660 EQUS "Error in main program"
 670 EQUB 0
 680 ALIGN
 690 :
 700 .keyevent
 710 TEQ R0,#11
 720 BNE exitevent
 730 TEQ R2,#&D
 740 BNE exitevent
 750 TEQ R1,#1
 760 BNE exitevent
 770 STMFD R13!,{R0,R1,R14}
 780 ADR R0,saveblock
 790 ADR R1,callbackhandler
 800 SWI "OS_CallBack"
 810 SWI "OS_SetCallBack"
 820 LDMFD R13!,{R0,R1,R15}
 830 :
 840 .saveblock
 850 EQUS STRING$(100,CHR$0)
 860 ALIGN
 870 :
 880 .callbackhandler
 890 STMFD R13!,{R14}
 900 ADR R0,hardcopystring
 910 SWI "OS_CLI"
 920 LDMFD R13!,{R14}
 930 ADR R14,saveblock
 940 LDMIA R14,{R0-R14}^
 950 LDR R14,[R14,#15*4]
 960 MOVS R15,R14
 970 .exitevent
 980 SUBS R15,R14,#4
 990 .fin
1000 STMFD R13!,{R7-R11,R14}
1010 TEQ R10,#0
1020 BEQ endoffin
1030 .disablekeyevent
1040 MOV R0,#13
1050 MOV R1,#11
1060 SWI "OS_Byte"
1070 TEQ R1,#0
1080 MOVNE R0,#eventv
1090 ADRNE R1,keyevent
1100 MOVNE R2,R12
1110 SWINE "OS_Release"
1120 .endoffin
1130 LDMFD R13!,{R7-R11,R15}
1140 ALIGN
1150 :
1160 .hardcopystring
1170 EQUS "HARDCOPYFX"
1180 EQUB 0
1190 ]
1200 NEXT pass%
1210 save$="SAVE SPcode "+STR$~code%+"
+ "+STR$~P%
1220 PRINT"*"save$
1230 OSCLI(save$)
1240 *SETTYPE SPcode FFA
1250 END
```

See Joe's Jottings, page 49

Listing 1. Simple percussion machine

```
 10 REM Percussion Machine
 20 REM by Joe Telford
 30 REM for B/B+/M/C
 40 REM (c) Acorn User June 1988
 50 :
 60 MODE 7
 70 PRINT ''''"PERCUSSION MACHINE 1"
 80 PRINT '''
 90 PRINT "This program is intended fo
r free "
 100 PRINT '"use, creating pseudo-sound
 effects"
 110 PRINT '"of a number of percussion
instruments"
 120 PRINT '''"Press SPACE to go on."
 130 REPEAT UNTIL GET=32
 140 CLS
 150 PRINT '''
 160 PRINT '"             T.......Triangle
"
 170 PRINT '"             C.......Cymbal"
 180 PRINT '"             H.......High Dru
m"
 190 PRINT '"             M.......Mid Drum
"
 200 PRINT '"             L.......Low Drum
"
 210 PRINT
 220 PRINT "You can create the rhythms
by tapping"
 230 PRINT "the different keys."
 240 PRINT '"Try now!"
 250 PROCenvelope
 260 PROCplay
```

Continued ▶

JOE'S JOTTINGS

◀ **Joe's Jottings listing 1 continued**

```
270 END
280 :
290 DEF PROCplay
300 REPEAT
310 instrument$=GET$
320 IF instrument$="L" SOUND 0,1,6,1
330 IF instrument$="M" SOUND 0,1,5,1
340 IF instrument$="H" SOUND 0,1,4,1
350 IF instrument$="C" PROCcymbal
360 IF instrument$="T" SOUND 1,1,190,1
370 UNTIL FALSE
380 ENDPROC
390 :
400 DEF PROCenvelope
410 ENVELOPE 1,1,0,0,0,0,0,0,126,-10,0
,-1,126,100
420 ENVELOPE 2,1,0,0,0,0,0,0,126,-5,0,
-1,126,100
430 ENDPROC
440 :
450 DEF PROCcymbal
460 SOUND 0,2,4,1
470 SOUND 1,2,180,1
480 TIME=0
490 REPEAT UNTIL TIME>7
500 SOUND 2,2,182,1
510 ENDPROC
```

Listing 2. Programmable rhythm machine

```
10 REM One Track Rythm Machine v.1
20 REM by Joe Telford
30 REM for B/B+/M/C
40 REM (c) Acorn User June 1988
50 :
60 MODE 1
70 DIM buf$(120)
80 *FX 226,140
90 *FX 227,150
100 PROCenvelopes
110 PROCkeys
120 PROCreset
130 PROCscreen
140 ON ERROR PROCerr
150 col%=0
160 row%=0
170 PROCdc
180 REPEAT
190 A%=FNmove
200 IF A%>=140 PROCstore(A%,col%,row%)
210 IF A%=127 PROCstore(127,col%,row%)
220 IF A%=ASC">" THEN PROCinctempo
230 IF A%=ASC"<" THEN PROCdectempo
240 A$=CHR$(A% AND 223)
250 IF A$="S" THEN PROCsave:PROCworkin
gs:PROCdc
260 IF A$="L" THEN PROCload:PROCworkin
gs:PROCdc
270 IF A$="D" THEN PROCdel:PROCworking
s:PROCdc
280 IF A$="C" THEN PROCcat:PROCworking
s:PROCdc
290 IF A$="N" THEN PROCdc:PROCreset:PR
OCshowbuf:PROCdc
300 IF A$="P" THEN PROCdc:PROCplay:PRO
Cdc
310 UNTIL A$="X"
320 CLS
330 END
340 :
350 DEF PROCdel
360 REPEAT
370 VDU 26,28,0,28,39,6,12
380 erf$="C"
390 PROCmess("RETURN for CAT...ESCAPE
aborts")
400 CLS
410 PRINT ''"Please type the name of t
he file"
420 PRINT '"on disc, which you want to
 delete"
430 PRINT '"Then press RETURN"
440 INPUT '"Filename: "f$
450 IF f$="" THEN PROCcat
460 erf$="C"
470 UNTIL f$<>""
480 ch%=OPENIN(f$)
490 CLOSE# ch%
500 IF ch%=0 THEN COLOUR 2:PRINT '"The
re isn't a file of that name.":COLOUR 3:
PROCmess("PLEASE PRESS SPACE"):REPEAT UN
TIL GET=32:PROCjj:CLS:VDU 26:erf$="":END
PROC
510 PROCmess("DELETING....Please wait"
)
520 PROCoscli("DELETE "+f$)
530 PROCjj
540 CLS
550 VDU 26
560 erf$=""
570 ENDPROC
580 :
590 DEF PROCload
600 REPEAT
610 VDU 26,28,0,28,39,6,12
620 erf$="C"
630 PROCmess("RETURN for CAT...ESCAPE
aborts")
640 CLS
650 PRINT ''"Please type the filename
that you"
660 PRINT '"want to load into this rhy
thm track"
670 PRINT '"Then press RETURN"
680 INPUT '"Filename: "f$
690 IF f$="" THEN PROCcat
700 erf$="C"
710 UNTIL f$<>""
720 ch%=OPENIN(f$)
730 CLOSE# ch%
740 IF ch%=0 THEN COLOUR 2:PRINT '"The
re isn't a file of that name.":COLOUR 3:
PROCmess("PLEASE PRESS SPACE"):REPEAT UN
TIL GET=32:PROCjj:CLS:VDU 26:erf$="":END
PROC
750 PROCmess("LOADING... Please wait!"
)
760 ch%=OPENIN(f$)
770 INPUT# ch%,tempo
780 FOR loop%=0 TO 120
790 INPUT# ch%,buf$(loop%)
800 NEXT
810 CLOSE# ch%
820 PROCjj
830 CLS
840 VDU 26
850 erf$=""
860 ENDPROC
```

Continued ▶

◀ Joe's Jottings listing 2 continued

```
870 :
880 DEF PROCsave
890 REPEAT
900 VDU 26,28,0,28,39,6,12
910 erf$="C"
920 PROCmess("RETURN for CAT...ESCAPE aborts")
930 CLS
940 PRINT ''"Please type the filename"
950 PRINT '"for this rhythm track"
960 PRINT '"Then press RETURN"
970 INPUT '"Filename: "f$
980 IF f$="" THEN PROCcat
990 erf$="C"
1000 UNTIL f$<>""
1010 ch%=OPENIN(f$)
1020 CLOSE# ch%
1030 IF ch%<>0 THEN COLOUR 2:PRINT '"A file of that name already exists":COLOUR 3:PROCmess("PLEASE PRESS SPACE"):REPEAT UNTIL GET=32:PROCjj:CLS:VDU 26:erf$="":ENDPROC
1040 PROCmess("SAVING... Please wait!")
1050 ch%=OPENOUT(f$)
1060 PRINT# ch%,tempo
1070 FOR loop%=0 TO 120
1080 PRINT# ch%,buf$(loop%)
1090 NEXT
1100 CLOSE# ch%
1110 PROCjj
1120 CLS
1130 VDU 26
1140 erf$=""
1150 ENDPROC
1160 :
1170 DEF PROCjj
1180 PROCmess("Another one of Joe's Jottings!")
1190 ENDPROC
1200 :
1210 DEF PROCmess(t$)
1220 GCOL 0,2
1230 PROCR(0,0,1279,96,1)
1240 VDU 5
1250 GCOL 0,1
1260 MOVE 640-((LENt$)/2)*32,80
1270 PROCdbh(t$)
1280 VDU 4
1290 ENDPROC
1300 :
1310 DEF PROCcat
1320 VDU 26,28,0,28,39,6,12
1330 erf$="C"
1340 *CAT
1350 PROCmess("PRESS SPACE WHEN READY")
1360 REPEAT UNTIL GET=32
1370 PROCjj
1380 CLS
1390 VDU 26
1400 erf$=""
1410 ENDPROC
1420 :
1430 DEF PROCdectempo
1440 tempo=tempo-10
1450 IF tempo=0 tempo=30:VDU 7
1460 PROCtempo
1470 ENDPROC
1480 :
1490 DEF PROCinctempo
1500 tempo=tempo+10
1510 IF tempo>960 tempo=960:VDU 7
1520 PROCtempo
1530 ENDPROC
1540 :
1550 DEF PROCplay
1560 erf$="P"
1570 temp=100/(tempo/60)-2
1580 TIME=0
1590 REPEAT
1600 FOR s%=0 TO 119
1610 char$=buf$(s%)
1620 IF char$="R" THEN s%=0:GOTO 1610
1630 PRINT TAB((s% MOD 12)*2+8.5,(s% DIV 12)*2+8.5)"*";
1640 IF INSTR("LMHTCWD",char$)>0 THEN PROCplayloud
1650 IF INSTR("lmhtcwd",char$)>0 THEN PROCplayquiet
1660 IF char$="-" THEN PROCskip
1670 VDU 8
1680 PRINT char$;
1690 NEXT
1700 UNTIL 0
1710 ENDPROC
1720 :
1730 DEF PROCplayloud
1740 IF char$="L" SOUND 0,1,6,1
1750 IF char$="M" SOUND 0,1,5,1
1760 IF char$="H" SOUND 0,1,4,1
1770 IF char$="D" SOUND 1,3,255,1:SOUND 0,1,7,1
1780 IF char$="W" SOUND 1,4,150,1:SOUND 0,1,7,1
1790 IF char$="C" SOUND 0,2,4,1:SOUND 2,1,255,1
1800 IF char$="T" SOUND 3,1,245,1
1810 T=TIME+temp-1
1820 REPEAT UNTIL TIME>=T
1830 ENDPROC
1840 :
1850 DEF PROCplayquiet
1860 IF char$="l" SOUND 0,2,6,1
1870 IF char$="m" SOUND 0,2,5,1
1880 IF char$="h" SOUND 0,2,4,1
1890 IF char$="d" SOUND 1,3,255,1:SOUND 0,2,7,1
1900 IF char$="w" SOUND 1,4,150,1:SOUND 0,2,7,1
1910 IF char$="c" SOUND 0,2,4,1:SOUND 2,2,255,1
1920 IF char$="t" SOUND 3,2,245,1
1930 T=TIME+temp-1
1940 REPEAT UNTIL TIME>=T
1950 ENDPROC
1960 :
1970 DEF PROCskip
1980 T=TIME+temp
1990 REPEAT UNTIL TIME>=T
2000 ENDPROC
2010 :
2020 DEF PROCenvelopes
2030 ENVELOPE 1,1,0,0,0,0,0,0,126,-10,0,-1,126,100
2040 ENVELOPE 2,1,0,0,0,0,0,0,126,-20,0,-1,126,60
2050 ENVELOPE 3,1,-2,0,0,255,0,0,0,0,0,0,0,0
2060 ENVELOPE 4,1,2,0,0,255,0,0,0,0,0,0,0,0
2070 ENDPROC
2080 :
2090 DEF PROCstore(a%,c%,r%)
2100 IF a%=127 THEN buf$(c%+r%*12)="-"
2110 IF a%>139 AND a%<148 THEN buf$(c%+r%*12)=MID$("hmlctwdR",a%-139,1)
2120 IF a%>149 THEN buf$(c%+r%*12)=MID$("HMLCTWDR",a%-149,1)
```

Continued ▶

◄ Joe's Jottings listing 2 continued

```
2130 PRINT TAB(c%*2+8,r%*2+8);buf$(c%+r
%*12)
2140 ENDPROC
2150 :
2160 DEF PROCkeys
2170 *KEY 0 P
2180 *KEY 1 <
2190 *KEY 2 >
2200 *KEY 3 N
2210 *KEY 4 C
2220 *KEY 5 L
2230 *KEY 6 S
2240 *KEY 7 D
2250 *KEY 8 X
2260 ENDPROC
2270 :
2280 DEF FNmove
2290 *FX 4,1
2300 REPEAT
2310 A%=GET
2320 PROCdc
2330 IF A%=139 PROCup
2340 IF A%=138 PROCdown
2350 IF A%=136 PROCleft
2360 IF A%=137 PROCright
2370 PROCdc
2380 UNTIL A%>139 OR A%<136
2390 =A%
2400 :
2410 DEF PROCup
2420 row%=row%-1
2430 IF row%<0 THEN row%=9
2440 ENDPROC
2450 :
2460 DEF PROCdown
2470 row%=row%+1
2480 IF row%>9 THEN row%=0
2490 ENDPROC
2500 :
2510 DEF PROCright
2520 col%=col%+1
2530 IF col%>11 THEN col%=0:PROCdown
2540 ENDPROC
2550 :
2560 DEF PROCleft
2570 col%=col%-1
2580 IF col%<0 THEN col%=11:PROCup
2590 ENDPROC
2600 :
2610 DEF PROCdc
2620 GCOL 4,0
2630 PROCR((col%*2+7.5)*32,1024-(row%*2
+9.5)*32,64,64,0)
2640 ENDPROC
2650 :
2660 DEF PROCerr
2670 IF ERR=17 AND erf$="C" THEN PROCjj
:CLS:VDU 26:erf$="":PROCworkings:ENDPROC
2680 IF ERR=17 AND erf$="W" THEN PROCjj
:erf$="":PROCworkings:ENDPROC
2690 IF ERR=17 AND erf$="P" THEN PROCsh
owbuf:erf$="":ENDPROC
2700 IF ERR=17 THEN PROCdc:PROCshowbuf:
ENDPROC
2710 REPORT:PRINT ERR;" @ ";ERL
2720 END
2730 :
2740 DEF PROCscreen
2750 GCOL 0,2
2760 PROCR(0,928,1279,96,1)
2770 GCOL 0,1
2780 VDU 5
2790 MOVE 128,1000
2800 PROCdbh("The Acorn User Rhythm Mac
hine v.1")
2810 VDU 4
2820 GCOL 0,2
2830 PROCR(0,0,1279,96,1)
2840 GCOL 0,1
2850 VDU 5
2860 MOVE 160,80
2870 PROCjj
2880 VDU 4
2890 PROCworkings
2900 ENDPROC
2910 :
2920 DEF PROCR(x,y,l,w,f)
2930 MOVE x,y
2940 DRAW x+l,y
2950 IF f=0 DRAW x+l,y+w ELSE PLOT 85,x
,y+w
2960 IF f=0 DRAW x,y+w ELSE PLOT 85,x+l
,y+w
2970 MOVE x,y+w
2980 IF f=0 DRAW x,y ELSE MOVE x,y
2990 ENDPROC
3000 :
3010 DEF PROCdbh(x$)
3020 LOCAL char%,c%
3030 c%=&70
3040 FOR char%=1 TO LEN(x$)
3050 ?c%=ASC(MID$(x$,char%,1))
3060 A%=10
3070 X%=(c% MOD &100)
3080 Y%=(c% DIV &100)
3090 CALL &FFF1
3100 VDU 23,141,c%?1,c%?1,c%?2,c%?2,c%?
3,c%?3,c%?4,c%?4
3110 VDU 141,10,8
3120 VDU 23,141,c%?5,c%?5,c%?6,c%?6,c%?
7,c%?7,c%?8,c%?8
3130 VDU 141,11
3140 NEXT char%
3150 ENDPROC
3160 :
3170 DEF PROCshowbuf
3180 FOR col=0 TO 11
3190 FOR row=0 TO 9
3200 PRINT TAB(col*2+8,row*2+8);buf$(co
l+row*12)
3210 NEXT
3220 NEXT
3230 ENDPROC
3240 :
3250 DEF PROCreset
3260 LOCAL loop%
3270 FOR loop%=0 TO 120
3280 buf$(loop%)="-"
3290 NEXT
3300 tempo=480
3310 ENDPROC
3320 :
3330 DEF PROCworkings
3340 erf$="W"
3350 GCOL 0,1
3360 PROCrows
3370 PROCbuffer
3380 PROCtempo
3390 PROCshowbuf
3400 PROCboxes
3410 erf$=""
3420 ENDPROC
3430 :
3440 DEF PROCboxes
3450 GCOL 0,1
3460 FOR col=0 TO 11
```

Continued ►

JOE'S JOTTINGS

◀ **Joe's Jottings listing 2 continued**

```
3470 FOR row=0 TO 9
3480 PROCR((col*2+7.5)*32,1024-(row*2+9
.5)*32,64,64,0)
3490 NEXT
3500 NEXT
3510 ENDPROC
3520 :
3530 DEF PROCrows
3540 LOCAL loop%
3550 FOR loop%=0 TO 9
3560 PRINT TAB(2,loop%*2+8);loop%*12+1
3570 PROCR(0,1024-(loop%*2+9.5)*32,6.5*
32,64,0)
3580 PRINT TAB(35,loop%*2+8);loop%*12+1
2
3590 PROCR(33*32,1024-(loop%*2+9.5)*32,
7*32-4,64,0)
3600 NEXT
3610 ENDPROC
3620 :
3630 DEF PROCbuffer
3640 PRINT TAB(2,4);"Percussion Track:
0"
3650 GCOL 0,1
3660 PROCR(32,848,21*32,64,0)
3670 ENDPROC
3680 :
3690 DEF PROCtempo
3700 GCOL 0,1
3710 PROCR(26*32,848,12*32,64,0)
3720 PRINT TAB(27,4);"TEMPO:       "
3730 PRINT TAB(27,4);"TEMPO: ";tempo
3740 ENDPROC
3750 :
3760 DEF PROCoscli(string$)
3770 DIM X% &FF
3780 Y%=X% DIV 256
3790 $X%=string$
3800 CALL &FFF7
3810 ENDPROC
```

Listing 3. Master rhythm machine

```
10 REM Acorn User Rythm Machine v.2
20 REM by Joe Telford
30 REM for M/C
40 REM (c) Acorn User 1988
50 :
60 MODE 129
70 DIM buf$(5,120),tempo(5)
80 *FX 226,140
90 *FX 227,150
100 PROCenvelopes
110 PROCkeys
120 PROCinitialise
130 PROCscreen
140 ON ERROR PROCerr
150 col%=0
160 row%=0
170 PROCdc
180 REPEAT
190 A%=FNmove
200 IF A%>=140 PROCstore(A%,col%,row%,
bufno)
210 IF A%=127 PROCstore(127,col%,row%,
bufno)
220 IF A%>=48 AND A%<=53 THEN bufno=A%
-48:PROCdc:PROCshowbuf(bufno):PROCbuffer
(bufno):PROCtempo(bufno):PROCdc
230 IF A%=ASC">" THEN PROCinctempo(buf
no)
240 IF A%=ASC"<" THEN PROCdectempo(buf
no)
250 A$=CHR$(A% AND 223)
260 IF A$="S" THEN PROCsave(bufno):PRO
Cworkings(bufno):PROCdc
270 IF A$="L" THEN PROCload(bufno):PRO
Cworkings(bufno):PROCdc
280 IF A$="D" THEN PROCdel:PROCworking
s(bufno):PROCdc
290 IF A$="C" THEN PROCcat:PROCworking
s(bufno):PROCdc
300 IF A$="N" THEN PROCdc:PROCreset(bu
fno):PROCshowbuf(bufno):PROCdc
310 IF A$="P" THEN PROCdc:PROCplay(buf
no):PROCdc
320 UNTIL A$="X"
330 CLS
340 END
350 :
360 DEF PROCdel
370 REPEAT
380 VDU 26,28,0,28,39,6,12
390 erf$="C"
400 PROCmess("RETURN for CAT...ESCAPE
aborts")
410 CLS
420 PRINT ''"Please type the name of t
he file"
430 PRINT '"on disc, which you want to
 delete"
440 PRINT '"Then press RETURN"
450 INPUT '"Filename: "f$
460 IF f$="" THEN PROCcat
470 erf$="C"
480 UNTIL f$<>""
490 ch%=OPENUP(f$)
500 CLOSE# ch%
510 IF ch%=0 THEN COLOUR 2:PRINT '"The
re isn't a file of that name.":COLOUR 3:
PROCmess("PLEASE PRESS SPACE"):REPEAT UN
TIL GET=32:PROCjj:CLS:VDU 26:erf$="":END
PROC
520 PROCmess("DELETING....Please wait"
)
530 OSCLI("DELETE "+f$)
540 PROCjj
550 CLS
560 VDU 26
570 erf$=""
580 ENDPROC
590 :
600 DEF PROCload(b)
610 REPEAT
620 VDU 26,28,0,28,39,6,12
630 erf$="C"
640 PROCmess("RETURN for CAT...ESCAPE
aborts")
650 CLS
660 PRINT ''"Please type the filename
that you"
670 PRINT '"want to load into this rhy
thm track"
680 PRINT '"Then press RETURN"
690 INPUT '"Filename: "f$
700 IF f$="" THEN PROCcat
710 erf$="C"
720 UNTIL f$<>""
730 ch%=OPENUP(f$)
740 CLOSE# ch%
```

Continued ▶

◀ **Joes Jottings listing 3 continued**

```
  750 IF ch%=0 THEN COLOUR 2:PRINT '"The
re isn't a file of that name.":COLOUR 3:
PROCmess("PLEASE PRESS SPACE"):REPEAT UN
TIL GET=32:PROCjj:CLS:VDU 26:erf$="":END
PROC
  760 PROCmess("LOADING... Please wait!"
)
  770 ch%=OPENUP(f$)
  780 INPUT# ch%,tempo(b)
  790 FOR loop%=0 TO 120
  800 INPUT# ch%,buf$(b,loop%)
  810 NEXT
  820 CLOSE# ch%
  830 PROCjj
  840 CLS
  850 VDU 26
  860 erf$=""
  870 ENDPROC
  880 :
  890 DEF PROCsave(b)
  900 REPEAT
  910 VDU 26,28,0,28,39,6,12
  920 erf$="C"
  930 PROCmess("RETURN for CAT...ESCAPE
aborts")
  940 CLS
  950 PRINT ''"Please type the filename"
  960 PRINT '"for this rhythm track"
  970 PRINT '"Then press RETURN"
  980 INPUT '"Filename: "f$
  990 IF f$="" THEN PROCcat
 1000 erf$="C"
 1010 UNTIL f$<>""
 1020 ch%=OPENUP(f$)
 1030 CLOSE# ch%
 1040 IF ch%<>0 THEN COLOUR 2:PRINT '"A
file of that name already exists":COLOUR
 3:PROCmess("PLEASE PRESS SPACE"):REPEAT
 UNTIL GET=32:PROCjj:CLS:VDU 26:erf$="":
ENDPROC
 1050 PROCmess("SAVING... Please wait!")
 1060 ch%=OPENOUT(f$)
 1070 PRINT# ch%,tempo(b)
 1080 FOR loop%=0 TO 120
 1090 PRINT# ch%,buf$(b,loop%)
 1100 NEXT
 1110 CLOSE# ch%
 1120 PROCjj
 1130 CLS
 1140 VDU 26
 1150 erf$=""
 1160 ENDPROC
 1170 :
 1180 DEF PROCjj
 1190 PROCmess("Another one of Joe's Jot
tings!")
 1200 ENDPROC
 1210 :
 1220 DEF PROCmess(t$)
 1230 GCOL 0,2
 1240 PROCR(0,0,1279,96,1)
 1250 VDU 5
 1260 GCOL 0,1
 1270 MOVE 640-((LENt$)/2)*32,80
 1280 PROCdbh(t$)
 1290 VDU 4
 1300 ENDPROC
 1310 :
 1320 DEF PROCcat
 1330 VDU 26,28,0,28,39,6,12
 1340 erf$="C"
 1350 *CAT
 1360 PROCmess("PRESS SPACE WHEN READY")
 1370 REPEAT UNTIL GET=32
 1380 PROCjj
 1390 CLS
 1400 VDU 26
 1410 erf$=""
 1420 ENDPROC
 1430 :
 1440 DEF PROCdectempo(b)
 1450 tempo(b)=tempo(b)-10
 1460 IF tempo(b)=0 tempo(b)=30:VDU 7
 1470 PROCtempo(b)
 1480 ENDPROC
 1490 :
 1500 DEF PROCinctempo(b)
 1510 tempo(b)=tempo(b)+10
 1520 IF tempo(b)>960 tempo(b)=960:VDU 7
 1530 PROCtempo(b)
 1540 ENDPROC
 1550 :
 1560 DEF PROCplay(b)
 1570 erf$="P"
 1580 temp=100/(tempo(b)/60)-2
 1590 TIME=0
 1600 REPEAT
 1610 FOR s%=0 TO 119
 1620 char$=buf$(b,s%)
 1630 IF char$="R" THEN s%=0:GOTO 1620
 1640 PRINT TAB((s% MOD 12)*2+8.5,(s% DI
V 12)*2+8.5)"*";
 1650 IF INSTR("LMHTCWD",char$)>0 THEN P
ROCplayloud
 1660 IF INSTR("lmhtcwd",char$)>0 THEN P
ROCplayquiet
 1670 IF char$="-" THEN PROCskip
 1680 VDU 8:PRINT char$;
 1690 NEXT
 1700 UNTIL 0
 1710 ENDPROC
 1720 :
 1730 DEF PROCplayloud
 1740 IF char$="L" SOUND 0,1,6,1
 1750 IF char$="M" SOUND 0,1,5,1
 1760 IF char$="H" SOUND 0,1,4,1
 1770 IF char$="D" SOUND 1,3,255,1:SOUND
 0,1,7,1
 1780 IF char$="W" SOUND 1,4,150,1:SOUND
 0,1,7,1
 1790 IF char$="C" SOUND 0,2,4,1:SOUND 2
,1,255,1
 1800 IF char$="T" SOUND 3,1,245,1
 1810 T=TIME+temp-1
 1820 REPEAT UNTIL TIME>=T
 1830 ENDPROC
 1840 :
 1850 DEF PROCplayquiet
 1860 IF char$="l" SOUND 0,2,6,1
 1870 IF char$="m" SOUND 0,2,5,1
 1880 IF char$="h" SOUND 0,2,4,1
 1890 IF char$="d" SOUND 1,3,255,1:SOUND
 0,2,7,1
 1900 IF char$="w" SOUND 1,4,150,1:SOUND
 0,2,7,1
 1910 IF char$="c" SOUND 0,2,4,1:SOUND 2
,2,255,1
 1920 IF char$="t" SOUND 3,2,245,1
 1930 T=TIME+temp-1
 1940 REPEAT UNTIL TIME>=T
 1950 ENDPROC
 1960 :
 1970 DEF PROCskip
 1980 T=TIME+temp
 1990 REPEAT UNTIL TIME>=T
 2000 ENDPROC
```

Continued ▶

JOE'S JOTTINGS

◀ **Joe's Jottings listing 3 continued**

```
 2010 :
 2020 DEF PROCenvelopes
 2030 ENVELOPE 1,1,0,0,0,0,0,0,126,-10,0
,-1,126,100
 2040 ENVELOPE 2,1,0,0,0,0,0,0,126,-20,0
,-1,126,60
 2050 ENVELOPE 3,1,-2,0,0,255,0,0,0,0,0,
0,0,0
 2060 ENVELOPE 4,1,2,0,0,255,0,0,0,0,0,0
,0,0
 2070 ENDPROC
 2080 :
 2090 DEF PROCstore(a%,c%,r%,b)
 2100 IF a%=127 THEN buf$(b,c%+r%*12)="-
"
 2110 IF a%>139 AND a%<148 THEN buf$(b,c
%+r%*12)=MID$("hmlctwdR",a%-139,1)
 2120 IF a%>149 THEN buf$(b,c%+r%*12)=MI
D$("HMLCTWDR",a%-149,1)
 2130 PRINT TAB(c%*2+8,r%*2+8);buf$(b,c%
+r%*12)
 2140 ENDPROC
 2150 :
 2160 DEF PROCkeys
 2170 *KEY 0 P
 2180 *KEY 1 <
 2190 *KEY 2 >
 2200 *KEY 3 N
 2210 *KEY 4 C
 2220 *KEY 5 L
 2230 *KEY 6 S
 2240 *KEY 7 D
 2250 *KEY 8 X
 2260 ENDPROC
 2270 :
 2280 DEF FNmove
 2290 *FX 4,1
 2300 REPEAT
 2310 A%=GET
 2320 PROCdc
 2330 IF A%=139 PROCup
 2340 IF A%=138 PROCdown
 2350 IF A%=136 PROCleft
 2360 IF A%=137 PROCright
 2370 PROCdc
 2380 UNTIL A%>139 OR A%<136
 2390 =A%
 2400 :
 2410 DEF PROCup
 2420 row%=row%-1:IF row%<0 THEN row%=9
 2430 ENDPROC
 2440 :
 2450 DEF PROCdown
 2460 row%=row%+1:IF row%>9 THEN row%=0
 2470 ENDPROC
 2480 :
 2490 DEF PROCright
 2500 col%=col%+1:IF col%>11 THEN col%=0
:PROCdown
 2510 ENDPROC
 2520 :
 2530 DEF PROCleft
 2540 col%=col%-1:IF col%<0 THEN col%=11
:PROCup
 2550 ENDPROC
 2560 :
 2570 DEF PROCdc
 2580 GCOL 4,0
 2590 PROCR((col%*2+7.5)*32,1024-(row%*2
+9.5)*32,64,64,0)
 2600 ENDPROC
 2610 :
 2620 DEF PROCerr
 2630 IF ERR=17 AND erf$="C" THEN PROCjj
:CLS:VDU 26:erf$="":PROCworkings(bufno):
ENDPROC
 2640 IF ERR=17 AND erf$="W" THEN PROCjj
:erf$="":PROCworkings(bufno):ENDPROC
 2650 IF ERR=17 AND erf$="P" THEN PROCsh
owbuf(bufno):erf$="":ENDPROC
 2660 IF ERR=17 THEN PROCdc:PROCshowbuf(
bufno):ENDPROC
 2670 REPORT
 2680 PRINT ERR;" @ ";ERL
 2690 END
 2700 :
 2710 DEF PROCscreen
 2720 GCOL 0,2
 2730 PROCR(0,928,1279,96,1)
 2740 GCOL 0,1
 2750 VDU 5
 2760 MOVE 128,1000
 2770 PROCdbh("The Acorn User Rhythm Mac
hine v.2")
 2780 VDU 4
 2790 GCOL 0,2
 2800 PROCR(0,0,1279,96,1)
 2810 GCOL 0,1
 2820 VDU 5
 2830 MOVE 160,80
 2840 PROCjj
 2850 VDU 4
 2860 PROCworkings(0)
 2870 ENDPROC
 2880 :
 2890 DEF PROCR(x,y,l,w,f)
 2900 MOVE x,y
 2910 DRAW x+l,y
 2920 IF f=0 DRAW x+l,y+w ELSE PLOT 85,x
,y+w
 2930 IF f=0 DRAW x,y+w ELSE PLOT 85,x+l
,y+w
 2940 MOVE x,y+w
 2950 IF f=0 DRAW x,y ELSE MOVE x,y
 2960 ENDPROC
 2970 :
 2980 DEF PROCdbh(x$)
 2990 LOCAL char%,c%
 3000 c%=&70
 3010 FOR char%=1 TO LENx$
 3020 ?c%=ASC(MID$(x$,char%,1))
 3030 A%=10
 3040 X%=(c% MOD &100)
 3050 Y%=(c% DIV &100)
 3060 CALL &FFF1
 3070 VDU 23,141,c%?1,c%?1,c%?2,c%?2,c%?
3,c%?3,c%?4,c%?4
 3080 VDU 141,10,8
 3090 VDU 23,141,c%?5,c%?5,c%?6,c%?6,c%?
7,c%?7,c%?8,c%?8
 3100 VDU 141,11
 3110 NEXT char%
 3120 ENDPROC
 3130 :
 3140 DEF PROCshowbuf(bufno)
 3150 FOR col=0 TO 11
 3160 FOR row=0 TO 9
 3170 PRINT TAB(col*2+8,row*2+8);buf$(bu
fno,col+row*12)
 3180 NEXT
 3190 NEXT
 3200 ENDPROC
 3210 :
 3220 DEF PROCreset(bufno)
 3230 LOCAL loop%
 3240 FOR loop%=0 TO 120
```

Continued ▶

◄ **Joe's Jottings listing 3 continued**

```
3250 buf$(bufno,loop%)="-"
3260 NEXT
3270 tempo(bufno)=480
3280 ENDPROC
3290 :
3300 DEF PROCinitialise
3310 LOCAL loop%
3320 FOR loop%=0 TO 5
3330 PROCreset(loop%)
3340 NEXT
3350 ENDPROC
3360 :
3370 DEF PROCworkings(bufno)
3380 erf$="W"
3390 GCOL 0,1
3400 PROCrows
3410 PROCbuffer(bufno)
3420 PROCtempo(bufno)
3430 PROCshowbuf(bufno)
3440 PROCboxes
3450 erf$=""
3460 ENDPROC
3470 :
3480 DEF PROCboxes
3490 GCOL 0,1
3500 FOR col=0 TO 11
3510 FOR row=0 TO 9
3520 PROCR((col*2+7.5)*32,1024-(row*2+9
.5)*32,64,64,0)
3530 NEXT
3540 NEXT
3550 ENDPROC
3560 :
3570 DEF PROCrows
3580 LOCAL loop%
3590 FOR loop%=0 TO 9
3600 PRINT TAB(2,loop%*2+8);loop%*12+1
3610 PROCR(0,1024-(loop%*2+9.5)*32,6.5*
32,64,0)
3620 PRINT TAB(35,loop%*2+8);loop%*12+1
2
3630 PROCR(33*32,1024-(loop%*2+9.5)*32,
7*32-4,64,0)
3640 NEXT
3650 ENDPROC
3660 :
3670 DEF PROCbuffer(bufno)
3680 PRINT TAB(2,4);"Percussion Track:
";bufno
3690 GCOL 0,1
3700 PROCR(32,848,21*32,64,0)
3710 ENDPROC
3720 :
3730 DEF PROCtempo(b)
3740 GCOL 0,1
3750 PROCR(26*32,848,12*32,64,0)
3760 PRINT TAB(27,4);"TEMPO:     "
3770 PRINT TAB(27,4);"TEMPO: ";tempo(b)
3780 ENDPROC
```

See Know the Score, page 55

Listing 1. Spanish Tummy

```
"RUN" []      "bass1" []     "bass2" []
"cat" []      "cls" []       "elstring" []
"guitar" []   "info" []      "key" []
"lead1" []    "lead2" []     "lead3" []
"lrest" []    "menu" []      "mix" []
"organ1" []   "organ2" []    "pan1" []
"pan2" []     "part1" []     "part2" []
"part3" []    "part4" []     "part5" []
"part6" []    "piano1" []    "press" []
"runup" []    "string1" []   "string2" []
"RUN" [% RUN word for
% Spanish Tummy by Ian Waugh
"123456" PLAY
menu
]
"bass1" [96, -2:
3 FOR( CCCC bbbb aaaa gggg )FOR
]
"bass2" [96,-2: CCCC EEEE dddd gggf GGGG
AAgg AAgg
]
"cat" ["CAT"OSCLI press
]
"cls" [26 #OUT   % Restores windows
12 #OUT   % Clears text area
]
"elstring" [2 CHANS
1 CHAN
   1 SHIFT      ON RM
2 CHAN
  -1 SHIFT     128 AMP
EVERY CHAN
 Hollow     Slowvib      Swell
]
"guitar" [2 CHANS
1 CHAN
  ON RM     300 OFFSET
2 CHAN
  128 AMP
EVERY CHAN
  Hard         Delvib        Long
]
"info" [cls NL NL NL 130 #OUT DISPLAY
%            Spanish Tummy
%   One of the nice things about AMPLE
%is the way you only need to enter
%repeating lines once. The whole tune
%is built around a very simple bass
%line which gives you lots of music for
%relatively little work.
%   The manic Spanish Guitarist plays
%basically the same riff twice but the
%second time it is offset a little in
%relation to the bass line. This is easy
%to do in AMPLE.
%   Finally, look at the "menu" word
%which shows how easy it is to write
%user-interactive menus.
]
"key" [K(-B-E-A)K
]
"lead1" [12, //// 1:DEdc
D/// /Edc D/// ////
//// //// //// ////
12, ^D8,Edc12,D EFGA 8,Bag12,fed EF//
   ///8,Gfe 12,F/// ////
8, ^// ABa gAg fGf eFe dEd cDc bCb
   aBa gAf GAf GAf GAf GAf GAf GAf
   G// /// /// /// Agf G// /// ///
   /// Agf
]
"lead2" [24, d//c c/// ////
     ^/// //// ////
]
```

Continued ►

◀ Know the Score listing 1 continued

```
"lead3" [12, //// 1:DEdc
D/// //Gf G/// ////
^/// //// //// ////
]
"lrest" [96, ^/// //// //// ///
]
"menu" [cls MENUDISP
%              Spanish Tummy
%               by Ian Waugh
%
%See info          %info press
%SHOW words        %SHOW press
%WRITE words to screen %WRITE press
%*CAT Disc         %cat
%Increase Tempo    %16 0 +T menu
%Decrease Tempo    %16 0 -T menu
%Original Tempo    %125 =T menu
%GET "menu" into NOTEPAD %"menu"GET
%      Use Cursor keys to Highlight
%          RETURN to Select
%-----------------------------------
MENU
]
"mix" [M5MIX 48,125=T
1 SHARE 1 VOICES Organ
 1 VOICE 120 VOL -2 PAN
2 SHARE 1 VOICES Slapbass
 1 VOICE 120 VOL 2 PAN
3 SHARE 1 VOICES Panflute
 1 VOICE 128 VOL 0 PAN
4 SHARE 2 VOICES elstring
 1 VOICE 104 VOL -1 PAN
 2 VOICE 104 VOL 1 PAN
5 SHARE 1 VOICES Upright
 1 VOICE 128 VOL 0 PAN
6 SHARE 1 VOICES guitar
 1 VOICE 128 VOL 0 PAN
PNUM SHARE
]
"organ1" [96, -2:
3 FOR( C/// b/// a/// g/// )FOR
]
"organ2"[96,-2: C/// E/// d/// g//f G///
A/g/ A/g/
]
"pan1" [48, D/// /E  32, dcg
48, f/// /// 24, Ge
48, F/// //GA
    g/// ////
]
"pan2" [1:
24, ^/// ///12,GA B/gABCba g///////
24, ^/// ///12,=AB C/=aBCDcb =a///////
24, ^/// //g=A B/// =a///
BCD/ D/// //// ////
a/// //// g/// ////
f/// //// G/// ////
]
"part1" [SCORE
key
organ1
organ2
organ1
64 6 -T   %Ritardando
C/// //^
]
"part2" [SCORE
key
bass1
bass2
bass1
CCCC C^
]
"part3" [SCORE
key
1: pan1
1: pan1
2: pan1
runup
pan2
1: pan1
1: pan1
2: pan1
32, 3: edc agf edc agf
24, c/// ^
]
"part4" [SCORE
key
1: string1
1: string1
2: string1
runup
1: string2
1: string1
1: string1
2: string1
c(!c)/// //// //// ^(^)
]
"part5" [SCORE
key
6 FOR( 192, ^/// )FOR
runup
piano1
]
"part6" [SCORE
key
lrest
lead1 G// /// /// /// /// ///
lead1 G/  12, /f/e /
lead2
lrest lrest
lead3
lead1 G// /// /// /// /// ///
lead1 G/ 12, //// G/// A///
             =B/// D/// ///^
]
"piano1" [24, efG/ G/// //// ////
+fG=A/ =A/// //// //=A/
BCD/ D/// //DE F/ed
12,dc 24,D//  //// //// ////
^cbC DEdc 12,=b=a 24,=B/ //// /
^agA BCba 12, gf 24,G/ //// ^
]
"press" [NL 132 #OUT 157 #OUT 135 #OUT
                % New Blue background
10 FOR( SP )FOR % Spaces to center text
"Press RETURN" $OUT
$IN  $2           % Wait for keypress
menu
]
"runup" [0: 24, //////// 12,
C(c)D(d)E(e)F(f)G(g)A(a)
B(b)C(c)D(d)E(e)F(f)G(g)A(a)B(b)C(c)
D(d)
]
"string1" [48,
e(G)/// //^(^)/
b(D)/// //^(^)/
a(C)/// //^(^)/
g(D)/// //^(^)/
]
"string2" [48, E(b)/// //^(^)/
   =A(d)/// //^(^)/
     g(d)/// //=A(e)/
     g(d)/// //^(^)/
     A(E)/^(^)/ g(d)/^(^)/
     A(E)/^(^)/ g(d)/^(^)/
]
```

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style menu demonstration a must for their accounts programs while programmers can change variable names using the upper to lower case converter.

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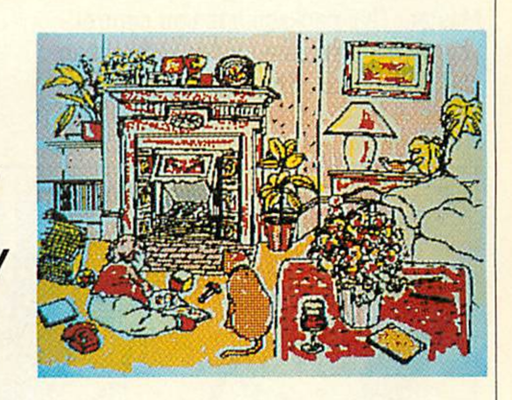
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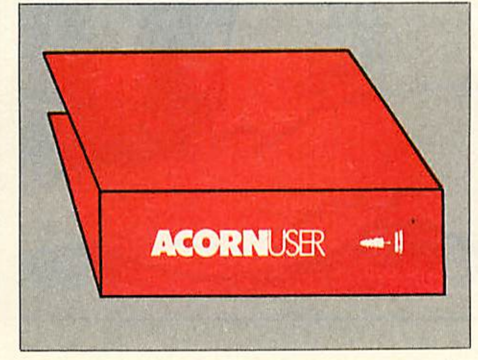


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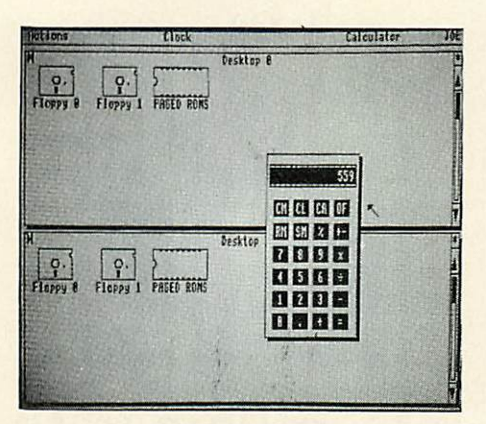
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Acorn User has put all your favourite programs, routines and utilities from 1987 on one disc. Whether you use your micro for graphics, business, word processing or playing games, the *Acorn User '87 Compilation* disc has something for you at only £6.95.

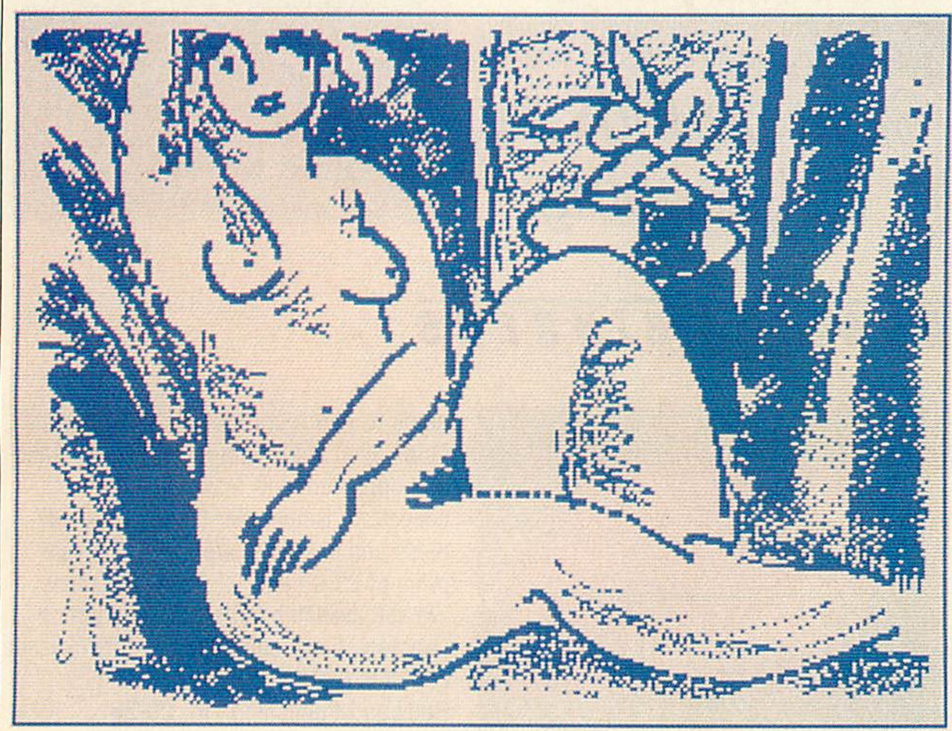
Featured are; Kiddie Art, the program that makes drawing a joy for children. And it's fun for the rest of us too! Tapestry presents an introduction to computer aided design via the craft of embroidery while PCB by CAD takes things a step further helping you to build your own electronic circuits. Theme and Autumn, our music programs from April '87, have been included for the budding musicians among you.

Also on the '87 *Compilation* disc is Joe Telford's GEM-like front-end for the Master. This package lets you control your ADFS files using icons rather than star commands. The package also includes the desktop calendar and year planner that Joe added in August '87. You can keep your floppy discs organised using John Weller's useful indexing and cataloguing programs and explore the geometric world of Pythagoras' Pines by Albert Koelman.

Other useful utilities on the compilation disc are proportional screen dumps, a *View* printer driver generator, a monitor testing routine and a routine for printing spreadsheets sideways.

The second half of the disc is devoted to graphics, with a video image enhancer and six of the best Graphics Bonuses from 1987, including a Lowry masterpiece, Whaam!, Monster, Coke Can and Planet Earth.

The *Acorn User '87 Compilation* disc comes in 5.25-inch 80-track format, with a comprehensive manual which included all function key strips and instructions needed for the programs.



Micro masterpieces on Portfolio for £9.95

Jonathan Inglis, freelance illustrator, has assembled a *Portfolio* of his best work exclusively for *Acorn User*.

The disc contains screens that have been used by national and regional publications. Included are Seurat's Bathers, a *Time Out* cover from August 1985, and two familiar *Acorn User* covers, Willow, (Nov '86) and Magician (Jan '86), as well as several pictures commissioned by *The Times*.

Three of Jonathan's favourite masterpieces are on the disc: Seurat's Riverside, Vermeer's Lady at the Virginals and a copy of a famous lithograph by Matisse. Sade fans will probably by more interested in the two stunning protraits of the singer included on the disc.

You can create your own *piece de resistance* using the Pixel Editor and Super Painter programs. Pixel Editor allows you to draw in and alter minute detail, while Super Painter enables you to draw lines, texture your screen and shade by mixing the eight standard colours.

Portfolio comes in 80-track 5.25-inch format with a comprehensive instruction sheet telling you about the pictures and how the artist created them. This disc can be yours for only £9.95.

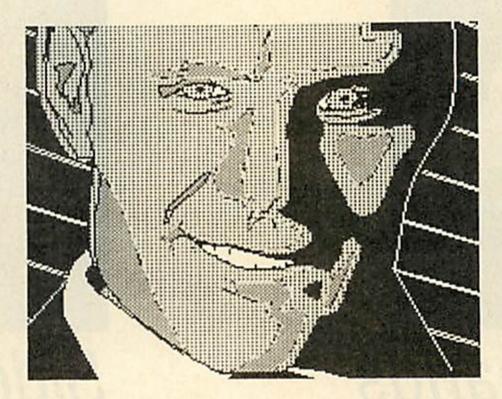
TO ORDER USE THE FORM ON PAGE 102

OFFERS

USERDUMP ROM

BBC/B/B+/M/C The *UserDump* ROM will allow you to dump any screen image in any display mode by entering a single command – either as a line of your program or by typing it directly from the keyboard. A perfect dump can also be obtained while a machine code program is running.

UserDump can dump a graphics window, make a distortion-free dump of *mode 0* screens using plotter graphics, translate a teletext screen into mode 1, and shift any area of memory.

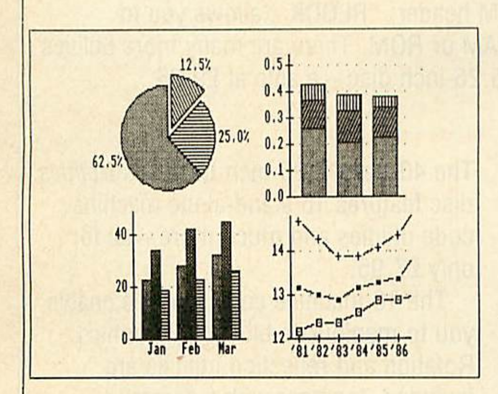


UserDump will work with any Epson-compatible printer which has single-density and double-density bit-image graphics including the Star Gemini, Delta, SG, SD and SR, Canon and Kaga NLQ.

Details of further commands and printer compatibility are available from Seran at Redwood Publishing Ltd, 20-26 Brunswick Place, London N1 6DJ.

Trouble free screen dumps for £19.95 with UserDump

VIEWCHART DISC



BBC/B/B+/M/C *ViewChart* features a suite of programs which can be used to produce high-resolution graphics in pie chart, bar chart or line graph form. Data can be entered manually, or read from *ViewSheet*, *ViewStore* or *View* files.

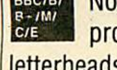
Present figures with ViewChart

The charts can be labelled and shaded to give a really professional appearance.

Epson-compatible screen dumps are included, one of which will produce a printout to the full width of an A4 sheet. Screen dumps for other printers can be painlessly installed.

The software is provided on a 5.25-inch 40-track disc (with 80-track converter). And the price of this professional package? Just £12.95.

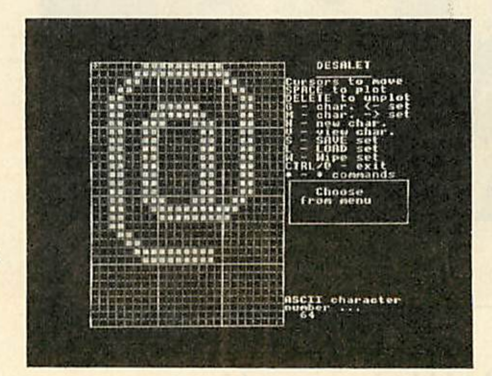
CALLIGRAPHY DISC



Now you can produce professional tickets, letterheads and posters with the *Calligraphy* disc.

Desalet is a font creator which produces customised letters to your personal design and saves you using repetitive data statements and error-prone calculations. All font sets can be up to 94 characters long.

Modical allows the use of disc-based font sets created with *Desalet*. *Modical* incorporates a modified file creation program, which allows files to be printed out immediately or saved for later.



An enhanced font ROM, in the form of a sideways RAM image, allows you to design your own fonts for use on-screen. Any output to the printer will be in the new font – thus giving true WYSIWYG.

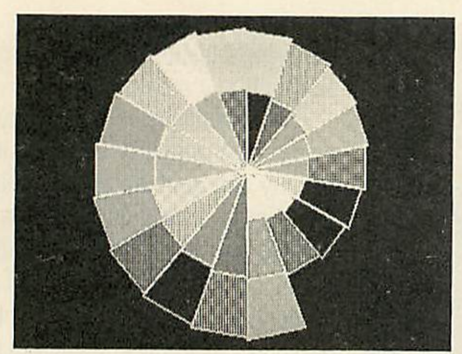
This superb disc comes on 40/80-track 5.25-inch disc and is only £9.95.

Design your own fonts with Calligraphy

ORDER WITH THE FORM ON PAGE 102

OFFERS

SOFTWARE GRAPHICS



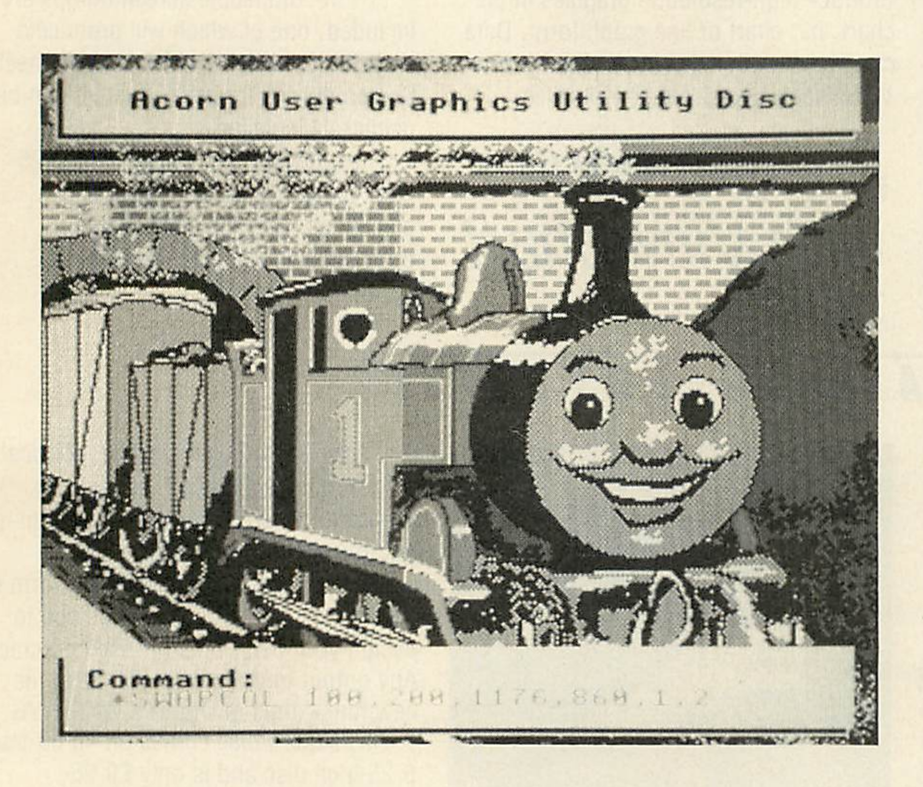


Utility commands on a chip

Plug in UserROM, our exceptional utility command ROM, and 19 of your favourite *Acorn User* routines are instantly accessible using star commands, eg, *BORDER; *CHECK; *Colfill; *Dotfill; *compress; *circle; *scroll. These are only a few of the many useful routines for just £19.95. Full details are available from Seran, Redwood Publishing Ltd, 20–26 Brunswick Place, London N1 6DJ.

Sideways RAM made simple

The *Acorn User* sideways RAM disc includes: RAMpad – your computer's answer to the pad and pen; six different on-screen fonts available in all modes; a 15k printer buffer; Screen Swap – store and recall mode 4 or 5 screens; *ROMHEAD – standard service ROM header; *RLOOK – allows you to examine sideways RAM or ROM. There are many more utilities on this 40/80-track 5.25-inch disc – a snip at £9.95.



Graphics Utilities disc – a bargain at £7.95

The 40-track 5.25-inch *Graphics Utilities* disc features 16 stand-alone machine code utilities and much more – all for only £7.95.

The 16 machine code routines enable you to manipulate blocks of graphics. Rotation and reflection utilities are included, together with a screen compressor/expander, a colour flood-fill routine and three screen-mode conversion commands. Parts of any graphics screen can be saved, copied, moved, have their colour changed or two of their colours swapped.

The Basic procedure library includes routines to produce multi-height, proportional and justified text as well as a procedure for 'drop shadow' boxes. All the procedures in the library can be used in your own programs.

An advanced teletext screen editor allows you to create colourful mode 7 screens which can be saved to disc. This routine gives you point plotting and line drawing, rubber-banding, and even a flood-fill. In addition, full text facilities including all the mode 7 control codes are available on this disc.

TO ORDER USE THE FORM ON PAGE 102

ORDER FORM

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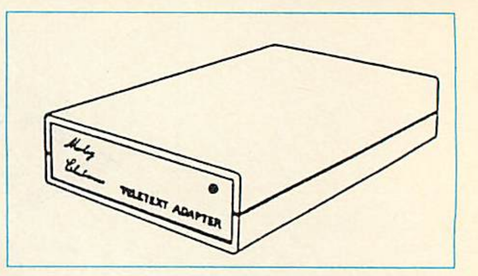
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TELETEXT ADAPTER

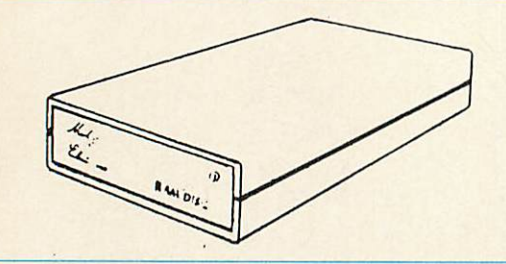


Would you like access to free high quality software and over a thousand pages of information, but Prestel access charges and phone bills too expensive? Then read on!
The answer is Teletext. Yes the same system everyone has seen incorporated into television sets, but with a difference. When Teletext is read by a computer you can actually use the data.
The MORLEY TELETEXT ADAPTER introduces you to the world of Teletext at a price that won't break the bank. Inside it you will find the latest in second generation Teletext chip technology, which unlike our rivals who are still using chips designed more than ten years ago, will be fully compatible with any future advances in the Teletext system.
With the Morley adapter you will get a state of the art unit that automatically tunes itself into the required station (no more messing around with screwdrivers or twiddling little knobs in the back of the case), a user friendly menu driven program, easy to follow instructions and a 12 month warranty. Add to this the free downloadable telesoftware and we are sure that you will agree that we are offering you one of the best bargains on the market today.

FEATURES:
* Advanced design uses the latest technology, will handle ANY future enhancements to the Teletext system e.g.: full field; 8 bit data transfer; 2k pages etc.
* Simply plugs into the user port.
* Low power consumption, less than 200ma. Optional power supply available.
* User friendly menu driven software including extended OSCLI and OSWord commands for access from BASIC programs.
* Supplied with 16k ATS (Advanced Teletext Software) and 16k support ROM software inc. printer dumps, page spoolers etc.
* FREE Telesoftware, no access charges (updated weekly).
* Save selected pages to disc/tape for later retrieval.
* Full access to all Teletext services and channels e.g.: CEEFAX, ORACLE, 4-TEL.
* Gives you a real-time clock at your disposal (*TIME).
* Software upgrades to allow for any enhancements to the Teletext service, e.g.: extra channels, full field data on cable & satellite systems etc. (only the media charge).
* Easy to follow comprehensive user guides.
* No hardware limitations, it can for example receive virtually unlimited numbers of channels.
* Utils disc available including printer drivers allows pages to be selected and dumped direct to a printer (no more TV or Radio Times to buy).

WHAT THE REVIEWERS SAID:
". . .In terms of price, performance, future expansion possibilities and those little touches that show thought for the end user I would recommend the Morley unit."–*(Acorn User, January, 1986).*
". . .The Morley unit has been designed to ensure that its operation is simple and smooth. It is the ideal Teletext adapter for school use."–*(A&B Computing, June, 1986).*
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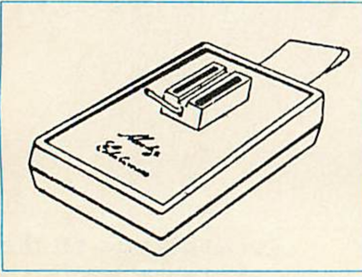
RAMDISC



Now available! The first true MEGA capacity RAMdisc for the BBC, BBC B+ and MASTER computers. This fully compatible unit, currently available in either 1 or 2 megabyte versions comes complete with operating software on ROM, power supply, and a comprehensive user guide.

FEATURES:
One megabyte of RAM connected to the 1mHz bus. Used with the supplied ROM software programs and files may be saved and loaded from the RAMdisc in the same manner as from a floppy disc with a large increase of speed, for example, a 20k mode 0 screen takes about 3-4 seconds to load from disc and about 0.2-0.3 seconds to load from the RAMdisc. The RAMdisc ROM operates as a utility ROM working with the current filing system rather than as a separate filing system. Therefore ensures compatibility with any Acorn compatible DFS (not ADFS). The RAMdisc can be selected by a * command to take the place of any drive number from 0 to 9. If the RAMdisc replaces a floppy drive as 0 for example, all commands addressed to drive 0 will be intercepted by the RAMdisc. The default drive number is 4. Any 'Dangerous' *commands such as *COMPACT, *COPY, *BACKUP etc can be intercepted and the BBC's RAM from page 2 to &7FFF saved to RAMdisc workspace, and may be recovered using a *command. This prevents accidental corruption of any programs/data in RAM you may have been using at the time. The filing system wedge ROM supplied supports load/save, byte file access, all relevant OSFSC commands, and contains a formatter verifier and 'sector' editor for use with the RAMdisc. Catalogue structure allows up to 2,688 files.
Well that's the spec., add to this our usual 12 month no quibble guarantee and we're sure you'll agree the Morley RAMdisc is the sensible alternative if increased storage capacity and speed is your requirement.

EPROM PROGRAMMER V2



The MORLEY EPROM PROGRAMMER V2 is a small self contained unit that plugs into the BBC or MASTER user port. It comes with a high quality ZIF (zero insertion force socket) and contrasting plastic case. Also included in the package is it's own user friendly menu driven software on ROM or disc.
This state of the art unit, allows programming of 2764 (8k), 27128 (16k), and 27256 (32k) EPROMS. Not only does the hardware allow programming of the usual NMOS devices, but will handle the new generation CMOS equally as well, and with the average time taken to program a 16k at less than 30 seconds we believe it to be one of the fastest programmers available today.
THE HARDWARE
The Unit is completely under software control, there are no knobs or switches to baffle the novice, and the extended features provided should excite the pro's.
THE SOFTWARE
The comprehensive user friendly software included in the package has two main parts, the first allows EPROMS to be read, programmed, verified and edited, also allowing a ROM image to be loaded or saved to disc. The second is a full ROM management system in its own right, which has a host of useful features and routines, such as KILL and RESURRECT ROM to disable or enable a sideways ROM, dump ROM image to buffer or disc, move ROM image in buffer to sideways RAM, and VIEW-SEARCH any sideways ROM.
The whole system is available now for less than the price of one WORDWISE chip. So get yourself the all new MORLEY EPROM PROGRAMMER V2 today and start using those expansion boards for what they were made for! ROMS.
Immediate delivery no quibble 12 month guarantee.

MASTER CARTRIDGE

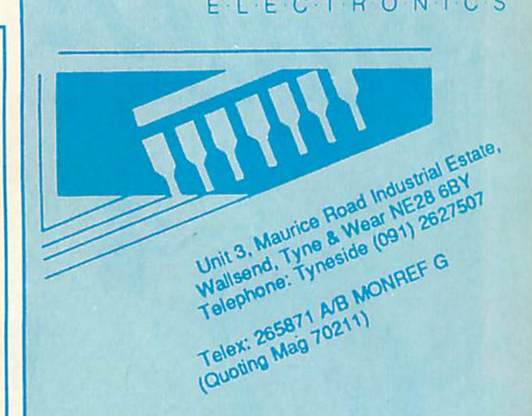
Designed and manufactured by Care Electronics to Acorn specifications.
These high quality Master expansion cartridges will take two 16k sideways ROM's, and will, unlike similar cartridges available from other manufacturers, accept the new second generation programs, such as Computer Concepts Interword and Spellmaster ROM's.
These Cartridges come in a high quality, robust, formed-plastic case, that fits neatly into either one of the Master's cartridge slots.
QUADS also available quad cartridges specifications as duels but taking 4x16k roms.

MASTER SMART CARTRIDGE

This device was designed and manufactured jointly by Morley and Care Electronics.
The **Smart** cartridge will at the press of a button halt any program running in memory and execute any one of a host of useful built in, or user defined procedures, and once completed will return to the program and continue where it left off. The only limiting factor with this device is the programmers imagination.
The **Smart** cartridge will prive useful to the novice, allowing him to do the simple things like dump any screen to printer, and make backups of protected tape or disc based software, but has an open ended specification for the advanced 'HACKER' allowing advanced programming techniques to be incorporated into almost any program at the touch of a button.
BUILT IN FEATURES (at the press of a button)
Autosaves computer's entire memory.
Freeze program at any point.
Screen dump (any mode) to printer or disc.
Allows any OSCLI command without disturbing memory.
Copies 90% of protected software.
Tape to disc, disc to tape.
User friendly menu.
Sound On/Off.

ALL CARTRIDGES COME WITH A 12 MONTH NO QUIBBLE WARRANTY

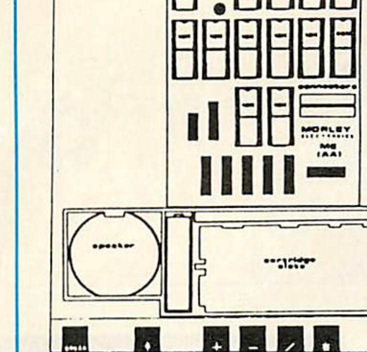
MORLEY MASTER BOARD 'AA'



At long last the add-on all MASTER users have been waiting for, an internal ROM board.

No more need to turn the computer off to insert the cartridge containing the ROM you need to debug the program in memory.

The new **MORLEY MASTER BOARD "AA"** allows you to have up to 8x16k and 4x32k extra Roms installed inside your MASTER and still leaves the cartridge slots free. This in effect allows your MASTER to support as many as 24, 16k ROMs installed permanently, whilst retaining the standard 4 x sideways ram banks and four banks by using cartridges



A staggering 32 ROM images installed and accessible at any time

Included in the package is a utility ROM which has many useful features such as 'FICOPY', a clever file transfer program that transfers files between DFS and ADFS formats or vice versa.

So for less than the price of four external cartridges you get a MASTER BOARD "AA" which with twice the capacity has got to be **THE** ROM expansion for the serious MASTER user.

The unit comes with the usual Morley, full no-quibble twelve months warranty, and our usual after sales service

THE COMPLETE RANGE OF TELETEXT SOFTWARE from M/B SOFTWARE

***NEW . . . DESIGN 7 PLUS** – now 'the best' is even better. Held in high regard by reviewers and hundreds of satisfied owners, DESIGN 7 has been further improved, with revised keystrip & even more features. Design/load/save and MODE 7 screen with ease, up to full CEEFAX/Oracle standard. Will convert ANY MODE 7 screen to a BASIC procedure, for inclusion in your own programs. ROM version includes a file copier, printer dumps useable from BASIC etc. B/MASTER/COMPACT.

TELETEXT EMULATORS/SCREEN DISPLAYS/INFORMATION SYSTEMS – A complete range of teletext programs to cater for all needs, with full teletext adapter interfacing.

***NEW . . . DESFAX** – totally new version – streets ahead of the competition – run your own information/display system. Stores hundreds of screens on dual 80 track drives (96 screens on single-sided 40 track), with access to any screen with a SINGLE KEYPRESS. Lots of special effects – screens can scroll, slide, overwrite etc. Animation, loops, subroutines – send for details – not enough space here to even begin to describe the advanced features!! B/MASTER/COMPACT

***NEW . . . MASTERFAX** – 84 MODE 7 screens in memory at once. 148 screens possible with cartridge RAM. An advanced teletext/carousel program featuring SINGLE KEYPRESS or 3-digit page selection. Runs entirely from memory – no disc accesses after pages are loaded. Superb animation and other effects. MASTER/COMPACT only.

***NEW . . . VU-FAX** – 1000 screens and no disc accesses! Screens stored on MORLEY 1MByte RAM DISC. SINGLE KEYPRESS gives instant access to any screen (or emulate teletext). This is the ultimate MODE 7 screen management system – there is nothing else like it. MODEL B/ MASTER 128.

***ALSO . . . MASTERcopy** – DFS/DFS, DFS/ADFS, ADFS/DFS, ADFS/ADFS file copier. Uses the MASTER 128's memory to the full to permit fast disc copying. 31 DFS files to ADFS disc in less than 2 minutes. Creates directories automatically. You will wonder how you ever managed without this program. Described by reviewers as 'unexcelled'. MASTER 128 and COMPACT's fitted with DFS ROMS.

ORDER FORM

To order simply complete and return by post enclosing your cheque/P.O. made payable to Morley Electronics, or by phone during office hours, quoting your ACCESS or VISA number.

Morley Electronics, Unit 3 Maurice Road Industrial Estate, Wallsend, Tyne & Wear NE28 6BY Telephone Tyneside (091) 2627507
Telex: 265871 A/B MONREF G (Quoting Mag 70211)

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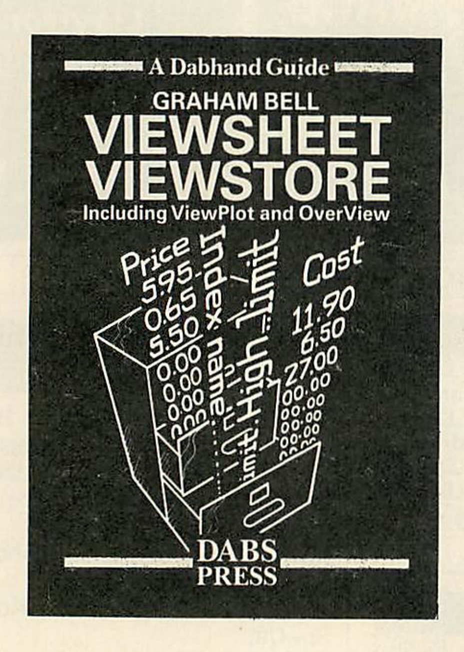

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REVIEWS

THE GAMES PAGE

ABOARD THE ARC

At last, a few brave souls are setting out on adventures with Archimedes. Carol Atack bids them welcome and checks in some other arrivals

With typical timing the sun comes out, the evenings are long and warm and the games companies go into overdrive to keep me indoors testing their floods of new products. Well in the case of the Archimedes, it's more of a dribble, although it's good to see others following in Superior's brave and lonely footsteps and putting out some product for the Arc.

Two of the Arc games are adventures, one from the well established Robico and another from the less well-known Heyley. Robico's *Enthar 7* opens with you hurtling to an unpleasant end with your hi-tech space podule completely out of control. Sadly the parser was also beyond my control and understanding. However, since this was a review copy I just leapt from scene to scene admiring the lustrous graphics which illuminate each puzzle. I am assured that Robico regulars will find it easier than I did to grapple with the required vocabulary.

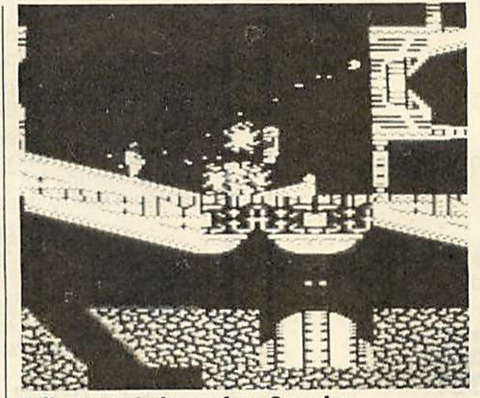
The collective brains of *Acorn User*'s technical department came to the eventual and correct conclusion that this was a demo version which didn't feature anything as boring as the actual game.

Heyley promises to 'strain your brain' and indeed *Stranded* did as I spent half an hour trying to load the disc into a Compact. Hint: it works better on the Arc.

The scenario is the usual space age thing and there's plenty to do. A Compact version is promised, hence my confusion.

The first standard shoot-em-up, *Quaser*, arrived not from a software house but from a group of friends in Shrewsbury. Although more care seems to have been lavished on their title-page credits than in thinking up an original game play, Quaser proves that the Arc could well outshine all other machines in the mundane business of fast and violent blasting.

Various objects assail your spacecraft as you glide along a vertically scrolling and very detailed landscape, looking for the scattered ground based targets. At one point your opponents are Arc logos and mouse pointers, as well as the more traditional colourful blobs and bullets.



Exile: expected soon from Superior

If only more software companies would turn from showing off state of the art graphics demos and get on with some good conversions. How many times do they have to be told?

If you want to see what can be done, send £8.95 to Julian Rockey at Brecklands, Broad Oak, Shrewsbury, Shropshire. Anyone else working on the Arc at home, let us know.

On the subject of conversions, Superior's latest is a version of last year's hit from Palace Software, *Barbarian*. The game caused heaps of controversy with its controversial (what else?) contents and packaging. The game is a well-written extension of the sword fight genre. If you're into that sort of thing and don't mind the bloodstains on your monitor, it's all very exciting: probably just the reason why loads of people with other computers bought loads of copies and made it a number one best seller.

Opinions on this kind of game vary and it would be true to say that the sharper-pixelled versions for machines like the Atari ST attracted negative comments for the blood and guts scenes plugged on the box. The decapitation scene was found particularly distasteful.

The basic premise of the plot — that the macho, male and muscle-bound protagonist goes out, kills lots of people and is rewarded with a woman — is a little bit dubious. This probably isn't the place to go into the sexual politics of it all, but many people felt *Barbarian* went too far with its packaging.

What was simply an extension of traditional fairy tales in cartoon form took on a new aspect as the box showed bodybuilder Michael Vanwigk and topless tabloid model Maria Whittaker 'dressed' as the game's characters. This photograph was widely used to promote the game and did its job very well, with endless debate and disagreement ensuring maximum publicity.

A year later Superior has a BBC version to promote, but the photograph in question isn't reappearing, not in *Acorn User* at least. Our thanks to Richard Hanson at Superior for understanding that our readers don't want to see page three-type photos featuring on our pages.

Who could object to a life-size version of the lovable lizard Repton? Soon to star in another big 40-screen sequel, *Repton Through the Ages*, Superior's most successful character is now available as a cuddly toy. A five-foot version will be on offer in an *Acorn User* prize competition later this year when they've got enough stuffing, but 15-inch versions look set to go on sale. One can only hope that the makers don't get round to Maria Whittaker!

Next month *Zarch* ace Sam Greenhill will be parking his hoverplane long enough to report back to earth-bound readers on happenings in the games world. And thanks to Dave Lawrence for his long stewardship of the page. His innovative programs and zappy one-liners will continue to be a feature of *Acorn User*.

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 | |  \                | |  \
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REVIEWS

GAMES

CONQUED OUT



Conqueror; Superior Software; Archimedes; £24.95 (disc)

Conqueror features David Braben's 3-D plotting routines as used in *Zarch*, a selection of real tanks, a handful of digitised sounds and quite honestly very little else.

There are three ways to play the game; you can either get some shooting practice in arcade mode, some tactical practice in attrition mode or play the real game in strategy mode. I found arcade mode was useful to get used to the keys but very dull in game play. I got nowhere in attrition and ended up almost straight away in strategy mode. I tired of the game very quickly and play it much less than *Zarch*.

The idea behind strategy mode is to take control of the objective, a white circle on the map, for at least 60 seconds. Extra points are awarded if you do well and you progress to the next level. In between levels you are permitted to increase your battalion by buying more tanks – the higher your score the more you can buy. Your enemy, the computer, also battles for control of the objective and if it manages to maintain a foothold for that vital minute then you lose.

There are a number of serious bugs in the program, all of which greatly detract from a good game. Your tank can get stuck on debris, making it impossible to move, your bullets quite often appear in the wrong place, and you can even fire through solid objects.

The plotting routines, although fast, frequently get very confused as to which surface to plot. Objects get too bright when in the foreground, the edges of the displayed area curl up, objects disappear too suddenly at the edges and seeing view under the landscape is common.

The game is slow and the animation jerky – bigger steps are used to make it appear faster. The keys are awkward to use and not redefinable, while the mouse control is useless. My biggest complaint is that there is only one viewing angle. You can often be fighting a battle behind a hill or a house and not be able to see your tank. The addition of east, west and north views would improve things or better still, an out-of-tank view.

Every cloud does have a silver lining and *Conqueror's* main plus point is the digitised sound. It sounds brilliant through my hi-fi: tanks rolling along, firing and explosions are all perfectly reproduced. The map display is also nice. The random layout of roads and houses makes each game different and the representation of the tank tracks is very good.

Overall *Conqueror* is not up to the standards of many BBC games. It would be nice to see a game the Archimedes can do with its hands tied behind its back rather than some spruced-up graphic demos that it can only just manage. I can't recommend *Conqueror*, especially at 25 quid a throw.

David Lawrence

CURSE OF THE PHARAOH

Tutankhamun's Revenge; Bug-Byte; BBC; £7.95 (disc)

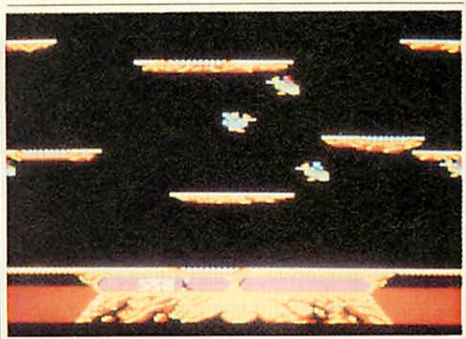
Remember the fashion for poor *Manic Miner* clones for the BBC micro? Games where the animation was jerky, the graphics were dull, and the controls were unresponsive? Bug-Byte has revived the genre with *Tutankhamun's Revenge*.

It's an arcade adventure – a pretty familiar format. Yet the game is difficult to play – or rather, just plain awkward. The odd bugs sprinkled through the game don't help.

The only vaguely unusual thing is the inclusion of a game designer, but this too is sub-standard. The games it allows you to design are even more limited than the main game. I've never even managed to finish designing a game – it always crashed losing hours of work. The whole thing is poorly done.

Ken Stewart

BUZZING BUZZARDS



Skirmish; Go-Dax; BBC, Master, Electron; £9.95 (tape), £11.95 (5.25-inch disc), £14.95 (3.5-inch disc).

Most Beeb conversions from arcade games are disappointing. The BBC doesn't have the power to reproduce accurately most of your paid-for favourites. *Skirmish* is the exception which proves the rule.

Skirmish is Delos Harriman's version of the unique *Joust*. You are a knight mounted on a giant buzzard; equipped with your lance you must fly around the rocky landscape dismounting your rivals. If you strike a competitor from above then you win – if you lose the height advantage then you fall to your death. The only controls are left, right and flap.

When toppled, your opponent becomes an egg. You can collect eggs for points, and you should do so quickly as they soon hatch into considerably more energetic competitors. When you have collected all the eggs, you move to the next level. If you take too long, an almost invulnerable pterodactyl appears to speed your departure.

The best feature is the two-player mode. Playing with a friend, you can attack each other: and there are times when you get a bonus for co-operating, and others for killing your fellow player.

This conversion is accurate right down to the hand which pulls you into the lava pool. And you can kill the vicious pterodactyl by hitting it square on the beak with the lance – but it usually kills me first! Movement is smooth and the graphics are clear, although you really need a colour monitor for the two-player game.

Skirmish requires the fast reactions of a shoot-em-up, and is much more interesting than an arcade adventure. Recommended.

Stuart Anderton

SOFTWARE

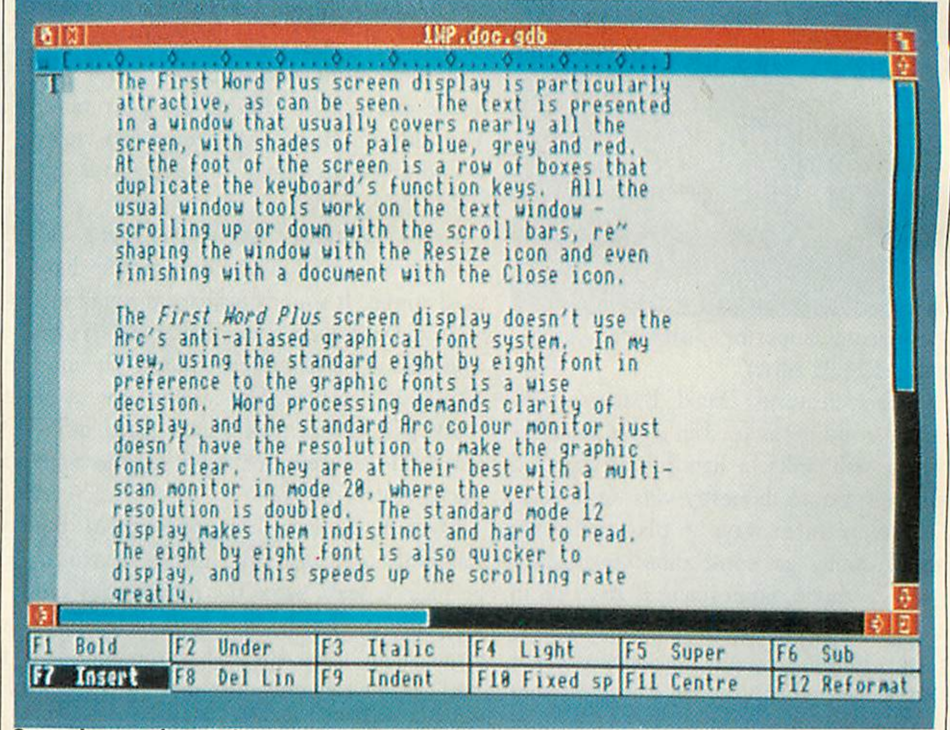
FIRST IMPRESSIONS

First Word Plus is a fully-featured wordprocessor for the Arc. Graham Bell tries it out

GST's *First Word Plus* wordprocessor is already successful on the IBM PC and its clones, and also on Atari ST machines. It is the first major Arc application produced by a software house new to the Acorn market. If the Arc is to succeed, companies like GST must be encouraged.

The *First Word Plus* screen display is particularly attractive, as can be seen in the picture. Your text is presented in a window that usually covers most of the screen, in tasteful shades of blue, red and grey. At the foot of the screen is a row of boxes that duplicate the keyboard's function keys. All the usual window tools work on your text; scrolling up or down via the scroll bars, reshaping the window with the resize icon, and finishing with a document using the close icon.

The standard eight-by-eight system fonts are used on screen for clarity and are much quicker to display than the graphics fonts, speeding up the scrolling rate greatly.



General screen layout showing a single text window

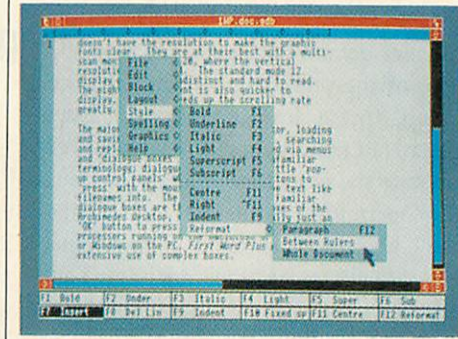
The major functions of the wordprocessor, loading and saving text, defining the page layout, searching and replacing and so on, are accomplished via menus and 'dialogue boxes'. These are simply little pop-up control panels that often have buttons to 'press' with the mouse and boxes into which to type text (like filenames). Figure 2 shows the page layout dialogue box. In common with most wordprocessors running on the Macintosh, or under GEM or Windows on the PC, *First Word Plus* makes extensive use of such text layout boxes.

The boxes are brought up via a menu. At any time, you can press the mouse Menu button to make an eight-item main menu appear. Each item leads on to a different subsidiary menu covering the options for filing, spelling or page layout for example. Figure 1 shows the menus linked to 'Style' in use, where the options give access to the reformatting commands.

Sensibly, there are are keyboard shortcuts to the most common commands and dialogue boxes. For example, to reformat a paragraph you just need to press function key f12; there's a reminder of this on the menu too. The menus are simpler to use, but, with experience, using the keyboard is quicker for many operations.

Typing in your text is just like *View* or *Wordwise*. The cursor keys can be used to move around the document, with Shift and CTRL speeding this up. In addition, the Page up and Page down keys can be used to move a screenful at a time, and of course the scroll bars are quickest for bigger movements. You can control the style of the text either via the Style menu, or by pressing the 'on screen' function keys, or with the function keys themselves. Bold, underline, italic, superscript and subscript text are all available, and with some printers you can have a 'light' style too. With NLQ printers for example, this makes the printer revert back to draft quality.

The different styles are shown on the screen in a reasonably realistic way. Page breaks are shown in the grey left margin area, and they are easy to alter with the mouse. Normal text is displayed dark grey. Italic characters are shown italicised, superscript and subscripts are small. Emboldening is shown in black and light text in a paler grey. Of course, using all these effects depends on the capabilities of your printer and the right printer driver.


Figure 1: Style menu leading to reformat

Some printers allow you to incorporate a number of accented characters into the text. You can't type them directly into the keyboard, but under the text window is a panel showing the selection available from your printer, and clicking on any character puts it into the text. The panel is shown in Figure 3. If your printer can produce the characters, then *First Word Plus* can be

used for foreign language text, but picking characters from the panel is slow – it's best reserved for very short passages and quotations. Sadly, scientific use is out, because it has no way of producing the necessary Greek characters.

The correct printer driver is loaded from the character panel too – clicking on 'Printer installed' brings up a dialogue box with the driver files listed. Double-click on your selection to load it. There is a utility program to customise a new driver, but this is only for the dedicated. Most needs are catered for as standard; the Epson LQ series and the GQ laser printer, Brother, Juki and Qume daisywheels and the normal FX and LX printers.

Figure 2: Page layout dialogue box

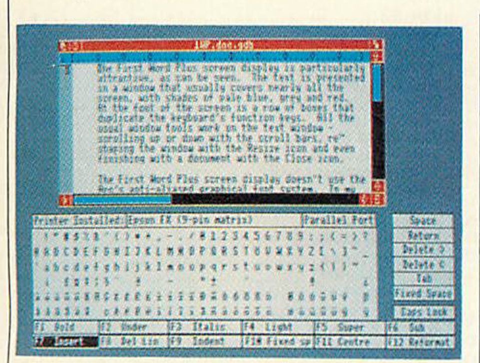


Figure 3: Close-up of FX80 printer panel

As with *View* and *InterWord*, the width of your text is controlled by a ruler which is usually shown at the top of the text window. This is easy to modify; Tab stops can be put in or deleted with the mouse, and either margin can be moved. There's also a 'Modify ruler' dialogue box (double-click on the ruler icon) which can be used to change the line spacing, justification and character pitch. New rulers can be inserted into the text at any point.

When you start up *First Word Plus*, the 'Open file' dialogue box springs up immediately. You can use this to load an existing document or start a new one. One particularly useful feature is that if you start a new piece of text, *First Word Plus* automatically looks for a file called 'Format'. The 'Format' file can store your preferred page layout, ruler and any starting text that you commonly use so that they are always there when you need them.

Like most BBC micro wordprocessors, headers and footers can be included on the page, and the 'Page layout' dialogue box gives you a chance to define what text and page numbering should be incorporated in the left aligned, centred or right aligned elements. But unlike *View*, the headers and footers take their ruler from the beginning of the document, not the current ruler. This is good, because it prevents the headers and footers changing positions on pages with different rulers.

One really good new feature is the ability to add footnotes into the text. The references to these appear as superscript numbers in the main text, each consecutively numbered automatically. The footnote text can be added in a little window of its own, and it gets printed at the bottom of the page. Where the reference changes pages, the location of the footnote moves automatically with the reference. There's a separate ruler for footnotes, so they could be formatted on a narrower measure than the main text, and you can define how much space should separate them from the main text.

I like the fact that the mouse pointer disappears while you are typing to prevent any possible distractions from the screen display. It reappears in its former position as soon as you move the mouse or press a button, so it's always available.

One area where the use of the mouse really helps is in marking blocks of text, to move or delete them using the Block menu, or change their text style using the Style menu or the function keys. Italicising a word is a matter of dragging the mouse pointer over the word to highlight it in black, then pressing f3. Figure 4 illustrates the process of picking out a whole paragraph in bold.

The extra memory of the Archimedes is used to good effect. You can hold up to four documents in memory at once, and best of all, you can cut text out of one and copy it into another simply by highlighting the text block. Cutting it moves it on to the 'clipboard'. Then you can make the other document active by clicking the mouse in its window, and retrieve the text from the clipboard with the 'Paste block' command. There's room for a total of about 40,000-50,000 words in memory on an Archimedes 310, which would be enough for a small book.

Another thing the Arc's speed allows the program to do is check the spelling of each word you type, as you type it. This doesn't seem to affect the speed of response of *First Word Plus* at all, it merely beeps when you make a mistake. The dictionary has 40,000 words and it uses about 90k of memory when you load it in, but there are a few unexpected omissions, 'Archimedes' and 'wordprocessor' for example, and no words with apostrophes, like 'doesn't'. However, you can add new words to a supplementary dictionary that is loaded and merged with the main set. In fact, you can build several extra dictionaries, perhaps one for each subject you write about – one a group of technical terms, another a group of names, and so on. But you can have only one extra dictionary loaded at once, and there's no way to check more than one except by ending the spelling check, and reloading the main dictionary and the second extra file. To make up for this, there is a utility program to add your own

words permanently to the main dictionary.

Another good feature of *First Word Plus* is that graphics can be incorporated into the text. Picture files can be imported from any graphics program that saves the picture in the usual *SCREENSAVE or sprite format – *Artisan* for example. The palette is imported too; even though the colours may not be true on screen, they are printed correctly, if you have a colour printer. It is easy to format the text around a picture, because the picture appears in the text window. Some printers distort graphics (they print circles as ellipses) and so a box appears around the graphic showing its true extent when printed – the size of the bounding box depends on the printer driver, so you can always get it right. Sadly, the printer drivers available don't include the Integrex Colourjet, one of the more popular colour printers.

When you decide to print out the document, you soon find you can't. At least, not without saving it to disc first. This is because *First Word Plus* does all its printing 'in the background', taking the text from the disc. Meanwhile you can be working on another document in memory.

I did find a few niggles with *First Word Plus*, and a couple of serious problems. There isn't any way of working in multiple columns and, if you need to do this, you'll find that *First Word Plus* definitely isn't the package for you.

It is certainly an annoyance to be unable to cut and paste a ruler easily. Quite often, you need to alternate between, say, a narrow ruler and a wider one. For example when you are incorporating lengthy quotations into a document, they are normally slighty narrower than the rest of the text. The only way I could avoid having to recreate a ruler every time was to save the two in separate files and read them in at appropriate points in the text.

Rulers also control the line spacing, so to change a document from single to double line spacing, you have to alter each and every ruler. Very tedious, particularly for such a common operation. I frequently use single spacing while I'm writing, and do a printout to check spelling and pick little errors in the text; reading from the paper is easier than reading from the screen. But then I change to double spacing for the final printout, sometimes leaving some sections (quotes, chunks of program or whatever) single.

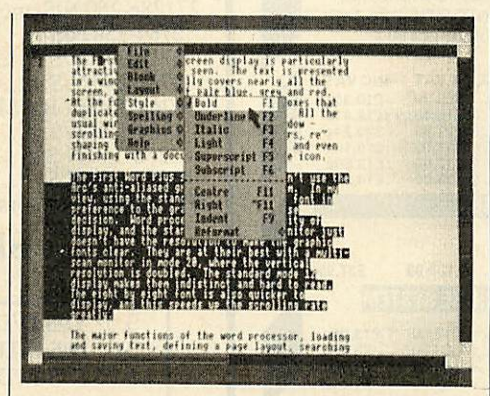


Figure 4: Picking out a paragraph in bold

MAIL MERGING

First Word Plus comes with *First Mail*, a program for sending out mailshots. This is much more comprehensive than the 'macro' facility in *View*, more in line with the programming language built into *Wordwise Plus*. You can write a letter, include patterns in it, and replace these patterns with lists of data from another file. Usually this would be a series of names and addresses.

But because you can include commands like 'Justify' in the standard letter file, you can be more ambitious. The text is reformatted after the data has been merged with the standard letter, so replacements can be done within the body of the letter without destroying the neat layout. The only problem at the present is that *First Mail* can't be easily linked to any existing database.

There are a couple of bugs in the version I reviewed. First, the text windows can be moved so they are almost impossible to retrieve. There should be a limit on the movement of each window, but this isn't really a problem. Secondly, and more importantly, hyphenation can sometimes get confused. When reformatting text, *First Word Plus* sometimes picks out a long word for possible hyphenation. A box appears showing where *First Word* thinks the hyphen should go – it's reasonably intelligent about it, putting it between double letters where possible, for example, and not allowing the hyphen too near the beginning or end of the word when you try to adjust the hyphen's position. These hyphens are soft – if the line is changed later, they disappear automatically. But the hyphenation box sometimes contains a word that isn't in the text – it appears to pick up remnants of edited words as well as the real text. These bugs should have been eliminated in the release version.

There is a real problem concerned with hanging indents. Normal indentation is easy – just press Indent when you start a paragraph. But hanging indents, where the first line is longer than the rest of the paragraph, can be done only by typing the paragraph, returning to the second line, then pressing Indent and Reformat. Yes, this works, but reformatting, as you tend to just before printing, destroys the hanging indent completely. Each paragraph takes its cue from the first line, so if the first line is at the left margin, all the others will be too. If you use hanging indents, for example in legal or report work, then don't use *First Word Plus*.

Global reformatting causes another serious problem too. Centred or right-aligned text is easy to incorporate in the document, with f11 or CTRL-f11. This formats the line according to the current ruler. But if the width of the ruler changes, if you perhaps decide to increase the width of the text, these sections don't move, so centered text is off-centre and right-aligned text doesn't move to the new right margin. Any centred or right-aligned text has to be completely rebuilt if you change the ruler.

It would be nicer to have control over the palette from within the program, but there is a standard palette file within the Resources directory on the disc, and this can be altered by loading it into the Arc Desktop in the usual way. There are too many colours on the screen for my liking, and modifying it in this way is a boon.

In general, I like *First Word Plus* very much, and there's no doubt that it will be the standard that future Arc word-processors will have to beat. It is the first 'real' Arc wordprocessor and offers several important features not available on BBC B wordprocessors such as graphics, footnotes, multiple documents and fast spelling checkers. At just over £100, twice or three times the price of *InterWord*, *View* or *Graphic Writer*, I'd still say it's good value.

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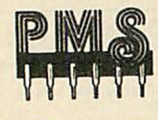
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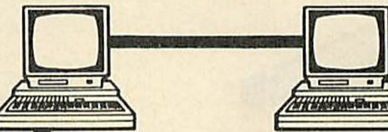
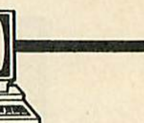
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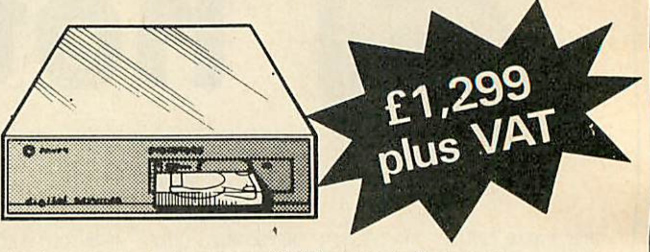


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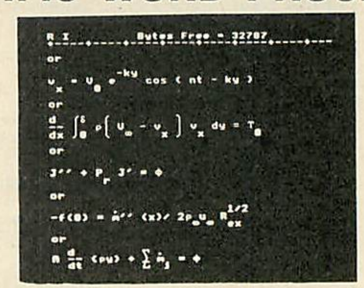
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SOFTWARE

FURTHER INTO DATABASES

Continuing our survey of databases, Roger Carus considers several which can be of value to secondary schools

If you work in business or education, the chances are that you use a database – even if you have never touched a computer!

Everyone keeps information that they expect to need again, and traditional ways like writing family records on the fly sheet of the family Bible have long ago been replaced by more efficient methods.

As most readers will know, the micro has opened up convenient ways of storing information, whether it is text or numbers, or even in the form of graphs and charts. A single floppy disc holding 200k on each side can store as much as 50,000 words, a typical paperback book on two discs.

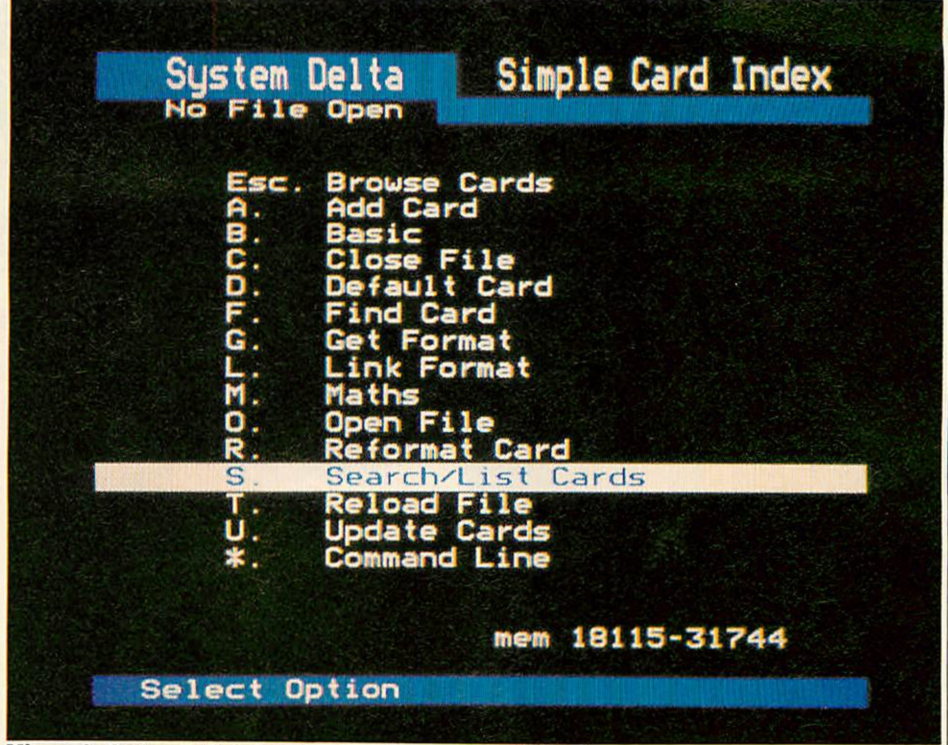
Database packages are no more than mechanisms for storing, sorting and presenting information you have put aside in the past. The problem is that when you begin to store data you must decide how to store it, and stick with your decision, even when better ideas about how to keep it become available. Many libraries use two or more cataloguing systems, subsequent ones improving on the first but never replacing it.

Let's take some practical examples of what this means: first, from business. If you are in retail trade you need to know your stock, what items, how many you bought, and what they cost. Also your suppliers' names, addresses and telephone numbers, and your regular customers.

Working in education you need to know who your pupils are, with information about them, their addresses, performance records, and so on. Plus the staff, the stock list, and even details of the rooms which are available with their space and facilities.

Because data processing plays such a large part in the curriculum today, you also need to teach pupils to have at least some idea of what a database is and how to use it. Some of the database managers aimed at education were covered last month in *Acorn User*, but at the secondary level more business-oriented packages are also usable.

Even at home, most people keep an address book, but the changes which take place make it look a mess almost from the start. How much easier to keep it on disc with all the information you need, ready to print out anew, in a convenient and correct form, every few months. The same can also be done with cookery recipies, plants in the garden, or records you own. Each of us has our own unique uses for a database.



Minerva's *System Delta* is a comprehensive and powerful tool

It is not easy to get reliable information about different database packages – availability changes very rapidly. About three years ago I reviewed a book, now out of print, on the business uses of computer software. The chapter on databases listed four good examples, not one of which is available today. Software dealers are of limited value too. Of 10 recent advertisers, only six replied to a simple inquiry about the suitability of their wares for a particular job – and most replies were too general to judge.

Reading *Acorn User* regularly can help with the reviews: a list is shown on page 121. I usually use three databases myself, although I have tried most of the popular ones at one time or other. The first is the old *Gemini* database which is a nice introduction and might still have a school use, but it is now almost an historic document.

The other two are Beebugsoft's *Masterfile II*, which I like for small domestic jobs, and the Mertec *Datascribe* which is no longer advertised but could be very good if it were not so complicated. I keep going back to it mainly because I like to use its related statistical package.

One of the biggest problems in changing to a newer system is that once you have learned to use one properly, it takes a great deal of mental energy to adapt to another, however simple it may be.

One way to avoid problems is obviously to try to choose a database system which can easily change with the times and your needs, but these tend to be the most complicated to learn to use well. One such is *System Delta*. This Minerva software attempts to do for the BBC micros what *dBase III* does for the IBM PC – provide a comprehensive tool designed to meet all database needs. The latest specification is so detailed that any summary is impossible.

There are versions of the basic package available for all models at a cost of about £70, but to design your own application from scratch you'll probably also need the

full manual which costs about £30.

Much has happened since we last looked at *System Delta*: at that time the conclusion was very favourable because of the high quality of the technical information and the 'extension to Basic' approach which made it so flexible. On the other hand, it was limited to mode 7 screens to allow reasonable memory storage. It was said to be the best programmable database management system for the BBC micro on the market and as such was clearly recommended.

How has it fared with time? Firstly, it has been adapted and developed to an extent which speaks well of the company and the product: not only does it cover the whole range of current hardware, but it has also greatly expanded its powers of storage and speed, while now offering mode 3 presentation. Even better, the top of the range version can prepare data for, and accept it from, *dBase, Lotus 123, ViewStore, Masterfile, InterBase* files and many more. But there is a price to pay for this flexibility, and that is complexity. I am not saying you could not master all these things, but it does take a long time.

However, Minerva have themselves tailored a large number of special applications packages to go with the main system, although they are mainly intended for the Archimedes with its extra speed and power. Some of the packages already available are for accounting and school administration; a larger number for such fields as libraries, newsagents and hotels are nearly ready.

If you want a top class system, the *Delta* is probably the right one for you. It would not be right for teaching purposes, but the *Administrator* package would be very useful to a school, and the profiling and timetabling modules too when they become available.

Starting today and without the problem of transferring existing data, I would certainly choose to use one, and only one, of the slightly simpler systems such as *InterBase* or *ViewStore* because of their ease of use and the extent of integration with other software. If I mainly needed a high-powered database then *System Delta* or Clares' *Alpha* or *Beta Base* seem right.

Beta Base is well up to the high quality of Clares' software. It has a large and popular following as a flexible database package. It comes on 5.25 or 3.5-inch disc and costs just over £25 for the basic BBC micro version.

The same system has now been developed into *Alpha Base* for the Archimedes at £50. This can accept files from the earlier version but offers far more power. *Alpha* and *Beta Base* should be seen as a less complicated competitor to *System Delta*, and if you don't want the specially tailored modules, then this could be your choice.

At the same time you may not need enormous storage capability, but prefer the ability to transfer data between database, spreadsheet and wordprocessor. That is probably a more typical use for most of us, so you may well prefer the integrated packages such as *ViewStore* or *OverView* – from Acornsoft, or *InterBase* from Computer Concepts. Both of these come in ROM form, and offer very similar facilities. However, *ViewStore* has the better manual, and is simpler to set up for your own 'card index' applications. *InterBase* has the major advantage of a good built-in programming language and potentially easier transfer of data to the companion spreadsheet and wordprocessor, but for most people these will be unnecessary or rendered impossible by the lack of examples in the manual.

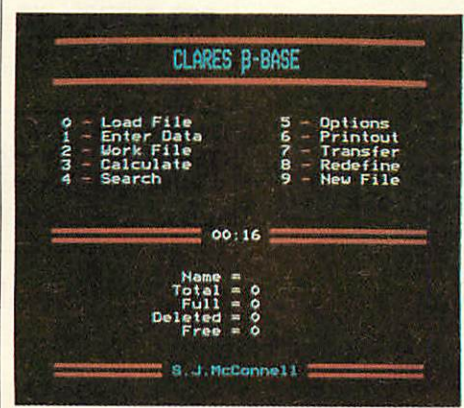
Like me, you may want something simpler and cheaper for home or even school use. A basic menu driven disc system is often quite sufficient, and will easily cope with domestic lists and selective searches. The *Masterfile* general purpose database must give Beebugsoft a great deal of satisfaction, since after over four years it still sells well and still deserves to do so. I like it very much and use it for a wide range of simple jobs. This is a disc-based suite of programs for under £20, which can store a great deal of information provided you limit each record to a single screen.

The flexibility of the screen display and the ability to sort, search, print with simple commands, produce labels, spool to a wordprocessor, plus a simple mailmerge facility, makes it ideal for anyone who does not want too much hard work but does need a practical database. It does not pretend to be fast: one file of 930 records can take two hours to sort, but it gets there in the end!

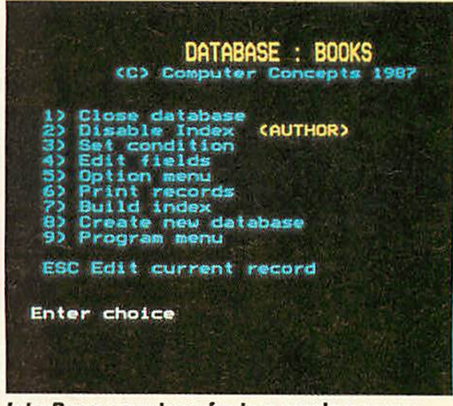
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DATA ABOUT SEVEN DATABASES

Publisher	Beebugsoft	Clares	Clares	Acornsoft	C. Concepts	Minerva	Minerva
Title	*Masterfile II*	*Beta Base*	*Alpha Base*	*ViewStore*	*InterBase*	*Delta*	*Delta Plus*
Price	£22	£25	£49.95	£59.80	£69	£29.95	£69.95
Manual	Included	Included	Included	Included	Included	Included	Extra
Supplied as	Disc	Disc	Disc	ROM	ROM	ROM & Disc	ROM & Disc
BBC B/Master	Yes	Yes	No	Yes	Yes	Yes	Yes
Archimedes	Coming	No	Yes	Emulator	Emulator	Yes	Yes
No. of fields	18	200	400	Almost unlimited	Almost unlimited	Almost unlimited	Almost unlimited
Linkage to W/P	Yes	Limited	Limited	Good	Good	Limited	Limited
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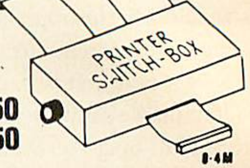


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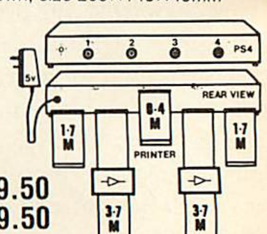
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version 1.17, and issue 2 of the additional notes and hints is very useful. It could be used as a teaching aid, to introduce secondary pupils to databases and their uses in preference to some of the demonstration programs discussed last month.

Choosing a database is one of the most serious decisions you can make once you have purchased your micro. First, because you have to learn to operate it, and second because once information is stored a change is very difficult. This may seem obvious, but it is so important that it needs explanation to help you understand how big the problem can become. Obviously the cost of the software is a consideration for most people, but that really must not be the deciding one with a database.

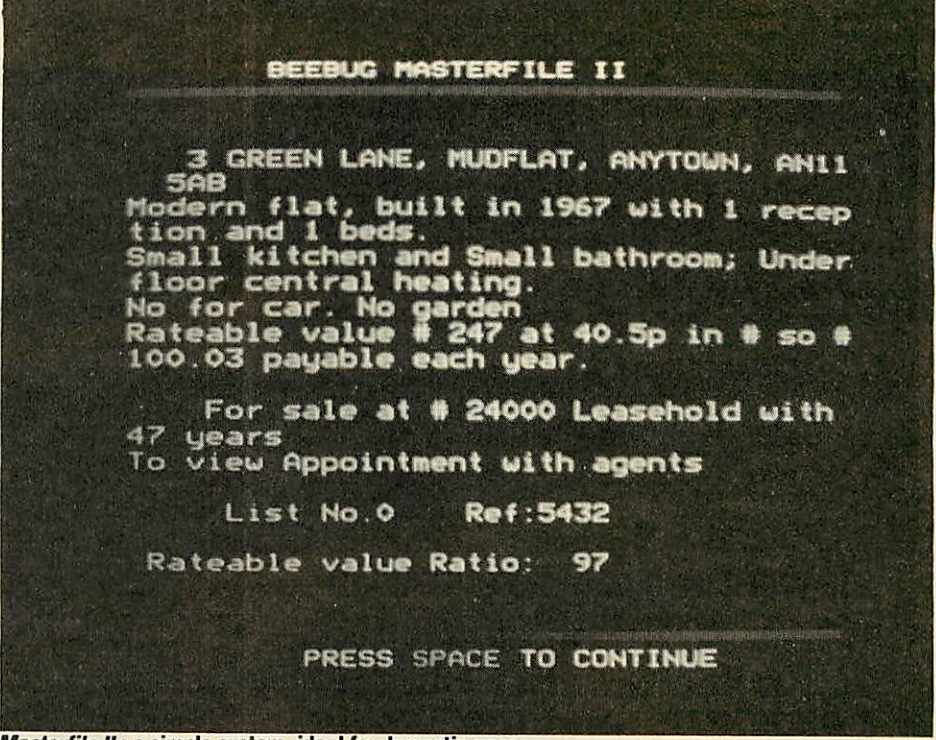
Most reasonably flexible database systems are quite complicated to use fully, so it takes some time to acquire the techniques you will eventually want to use. You must learn how to set up a new database, to input data, and most important of all to retrieve it in a form you want and can use, before you know how easy it is to use.

That sounds easy, but even the *Masterfile* manual, which is well written, runs to 49 pages and takes some time to understand. You need to have created two or three different databases with a reasonable quantity of real data before you have any idea whether it is suitable. By that time the investment of time easily outweighs the money spent on the software, and the answer could still be that you find it unsuitable.

Let me give an example of this: when I first used *Masterfile*, it was to hold the family address book complete with telephone numbers, and there were 125 entries. It took three abortive attempts to get the choice of fields right, then two afternoons to put in the information. On reaching record 87, a small mistake meant I needed to delete an earlier record. I misunderstood the instructions on compacting a file, and ended by unformatting the disc – back to square one!

The implications of the second problem are even greater. You have a database you like and use it for a year or two, building up several valuable files. Then there are new developments in database software, which has certainly been the picture over the past five years.

So, you decide you will move up to the new system. But what about all the data in your old files? You can be almost certain the systems will be incompatible. That leaves you with the difficult choice of using the two systems in parallel, losing all the ability of your new system to process the data, or keying in the data again.



***Masterfile II*: a simple system, ideal for domestic uses**

Sometimes the most you can hope for is to design an output from the old system which is in a convenient sequence to read as you type it in again. The import facility of each of the datases is thus very important, and *ViewStore* and *System Delta Plus* both score here. *InterBase* is good too, but it does mean delving into the manual.

Another illustration from experience: among my files is one with about 750 entries, each filling a complete screen, with both words and accurate, carefully checked numbers which matter.

I like the system they are held on, but I really need an ambiguous search facility to find all the records with a word containing the letters 'mph' appearing anywhere in the title for example. (If you are confused, it is a list of paintings and I might want to identify one with a defaced title which could be either 'triumph' or 'nymph'.) The current system is good for most purposes, but it just cannot do that one thing unless I know whether it is recorded in upper or lower case type. The thought of transferring the records to a different system is just too much, but I had no idea that would become so important.

It is not very difficult to give general advice to anyone about databases, and the range of costs is roughly £20 to £100. If you are concerned with using or teaching simple data processing, you should choose either a demonstration program from last month's selection, or one of the very simple domestic systems such as *Masterfile*.

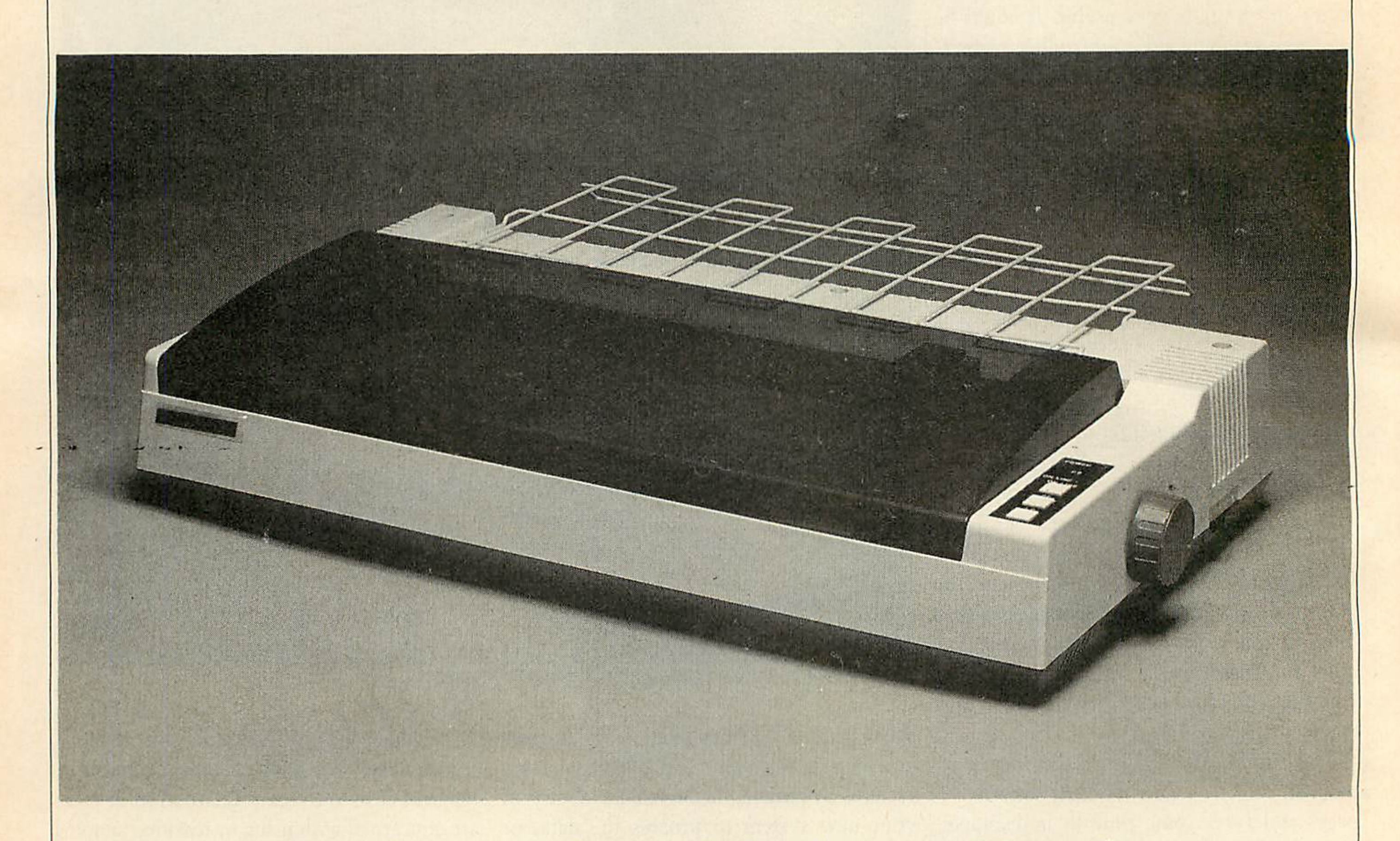
If you need to have several thousand records, with more than one screenful of information on each item, as well as frequent sorting and searching, then you must have a dedicated system like *System Delta*, especially if there is a ready application package. That is probably true for many administrative processes.

Finally, if your needs are between these, and you need a tool to help you sort data and display it with text then you are likely to be best off with whichever database is designed to link to your chosen word-processor; there is very little to choose between the *View* and *Inter* families.

Some *Acorn User* articles on databases: Databases for Schools Use, February 1986 and May 1987; Acornsoft's *ViewStore*, May 1986; Minerva's *System Delta*, November 1986; Addison-Wesley's *Dataprobe* for schools, February 1987; Choosing and Using a Database, March 1987; Computer Concepts' *Interbase*, November 1987; Acornsoft's *OverView*, March 1988

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MIND YOUR LANGUAGE

A computer and good software can make light work of language learning, says Dave Futcher

Both BBC radio and television have been strong on language learning for some 60 years, and now three first-stage language series have their own integral software components: *A Vous La France!*, *España Viva* and *Deutsch Direkt!*

These series are designed for people at home, but the software is worth considering for use in school. Many teachers have realised that the micro can be an instructor, animator, facilitator and stimulator, yet there is little good dedicated software.

The French and Spanish packages can be treated as a pair because they are very similar, having been written by Dr Marie-Madeline Kenning of the University of East Anglia and Dr Michael Kenning of Essex. *La France!* comprises 45 programs on three discs divided into 15 equal units. Three of these are for revision. *Viva* also has three discs, with 15 units of two programs each, only one of which is a revision unit. A booklet describes each program and explains how to use them.

Both *La France*! and *Viva* introduce everyday situations and develop language themes in meaningful contexts. They provide practice in the sort of language required for such needs as booking accommodation, finding your way around or shopping. 'Where' covers giving as well as understanding directions, based on a simple map. 'Newtown' lets you ask and answer questions about where to stay or eat, where to visit and so on.

There are also a number of programs based on text reconstruction. 'Rebuild' is about filling in gaps based on meaning, and 'Blankit' helps to make sense of something when some of the words are missing. Added to these are basic grammar exercises such as the use of pronouns, adjectives and their relative gender agreement.

Deutsch Direkt! was developed by Paul Meara and Roger Mitton at London University's Birkbeck College. It is intended to complement the BBC's first-stage German course, in the same way as the first two packages, but does so in a totally different way. It aims to help the user acquire a basic German vocabulary, and so the software contains a dictionary of over 1000 words and a set of programs based around the words.



The package uses a set of six programs to do this. 'Words' teaches vocabulary in 69 blocks of 15 words each. 'Review' follows on from 'Words', but you can use 'Review' independently to go over any block. It gives the German and the English for each word, plus the plural form for nouns and the past tense for verbs.

'Square' hides words in a square of letters and gets you to search for them. If you've been learning a set of words, 'Square' gives you the chance to continue working with the same block.

'Links' is a practice exercise that uses the dictionary like a maze. You must find your way from one word to another along a chain of connections. 'Clock' lets you test yourself against the clock to see how quickly you can recognise the words you have learnt.

Finally, the 'Topics' program lets you use all the other programs with groups of words that relate to 36 different topics: shopping, travel, the body, job, weather, colours, for instance.

Vocabulary rehearsal programs are often among the worst pieces of educational software around. They are tedious and uninspiring, and yet sales of this kind of software are high. Under all the frills, *Deutsch Direkt!* is drill and practice, but it's done better than most, and helps overcome the daunting prospect of the sheer volume of words needed to be learnt.

In a number of the exercises in the three packages, the user is required to type in accented letters. The BBC micro has never been the best machine to do this on, so BBC Soft resorts to providing function keys to type in these letters.

These packages are in the best tradition of BBC software: good quality, value-for-money and robust. They fit in well with the ideas behind the TV and radio series. One drawback is that they lack the spark shown by the leading language packages. Those which come to mind are the outstanding *Quelle Tête* and *Hopfjager* developed at Homerton College in Cambridge, and *Granville,* which must be the best piece of language software around.

The Homerton pair take an unusual approach in that they ask pupils to build up an 'identikit' face by selecting facial features from lists of words. *Granville* simulates planning a holiday in French. None covers the vocabulary range of the BBC trio, but they are great motivators.

Language software in general needs to borrow ideas from the very best of available simulation resource packages. *Granville* takes this approach and succeeds in stimulating discussions and comprehension in French. And for teachers considering a more open-ended approach to foreign language learning, an excellent example would be using a wordprocessor, such as Tedimen's *Folio* which has European versions aimed at the school sector.

A Vous la France, *£24.95;* España Viva, *£22.95;* Deutsch Direkt! *£22.95 from BBC Soft, 80 Wood Lane, London W12 0TT.* Quelle Tête, *£19.50,* Hopfjager, *£19.50,* Granville, *£27.50; all from Cambridge Micro Software, Edinburgh Building, Shaftesbury Rd, Cambridge CB2 2RU.* Folio, *£25 from Tedimen Software, PO Box 23, Southampton SO9 7BD.*

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BUSINESS

WHY DIDN'T I THINK OF THAT?

Roger Carus presents more good ideas that you've sent in for using micros

The arrival of the Archimedes has brought a new kind of response to the open invitation to tell others what you are doing with your equipment: many are finding ways of adapting old programs and large databases to the enormous potential of the new, faster and much more powerful hardware.

Several readers have asked about transferring the material they have built up into new formats, while still gaining from the extra applications available. So far there are more questions than answers, but I will pass them on as they come.

What is pleasing is the clear evidence that those with older equipment and software are still able to find new and ingenious ways of making their efforts productive. Among the most impressive material I have seen in recent months is that sent by C G Roberts of the Halesowen Climatological Station, who collects data for the Meteorological Office and assembles it using the micro into a form ready for passing on to them.

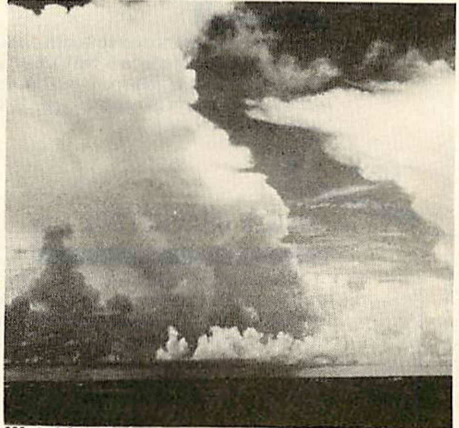
He collects the raw weather data and enters it into a *ViewSheet* model. Most of his data is of a numerical type – barometer readings, temperature and so on – but some is textual, such as cloud types and wind directions. In all there are 58 columns of data together with a 50-character 'Weather Diary' giving a general impression of each day.

Each month's data is collated using a Master 128 Turbo and its built-in *ViewSheet* spreadsheet application. This is ideal for working out the averages and statistics that the Met Office requires. Then a dot matrix printer is used to print it in various formats, while both *ViewPlot* and *ViewChart* convert selected parts of the data to graphic form.

The finished product is both impressive and useful, and is a profitable source of income in Mr Roberts' retirement.

By way of contrast, some mathematicians have come out of their ivory towers, using modern technology to solve old classroom problems in an efficient and labour-saving way.

One such is Francis Usherwood of Purley, who has written to me twice recently with neat little solutions to such problems in the classroom. The first was a simple nine-line program to solve polynomial equations which are increasingly to be found in A-level mathematics examinations. It is quick and more convenient than the traditional classroom use of the Newton-Raphson successive approximation method – although I suspect the examiners might have doubts about using this approach!


Watching the weather with *ViewSheet*

PHOTOGRAPH BY THE LONDON METEOROLOGICAL OFFICE

He went on from this to try the method on a much more complex form of the equation, and once again it succeeded, saving over a page of working. If anyone wants a copy of the program I will gladly put them in touch with him.

From the theoretical to the very practical: occasionally a reader will ask me for advice, and, when I can, I do try to help.

One such question left me stumped. It came from P Mullans of Bognor Regis who wanted to know whether there is any software to assist with boat design which might be capable of producing the necessary co-ordinates for smooth curves in three dimensions. So far as I can calculate, that would require more memory than a micro can offer, but if I am wrong he will be most grateful for a reader's solution.

Dr A Refsum of the Queen's University, Belfast described his concern – that of firing samples of new superconducting ceramic materials. His kiln must be carefully temperature-controlled, and he had a BBC micro to hand. So with the addition of a thermocouple to measure the temperature, and a series of relays to control the electrical kiln heaters, the micro monitors and adjusts the temperature and ensures the samples are correctly fired.

The last one for this month is a practical, commercial application which might well help others too. It comes from D E Ketteringham of Harrow Weald in Middlesex, who has developed a typesetting program for small printing machines which use handset type, such as the Adana eight-inch by five-inch letterpress. Even today these are still in use by schools, clubs and a few small businesses.

The program is disc based, written in Basic, and has capacity for data on 150 typefaces held in 15 files. Every letter in a particular typeface is a different width, and setting up type is a very skilled and time-consuming job, because spacers need to be added to justify each line. It is a job which lends itself to the micro, especially when word-wrap and justification is taken into account, as the computer can add up the widths of the letters in a line, and calculate the spacer widths required.

Just to complete the job he has also added a stock control program for typefaces which allows the most efficient use to be made of expensive type. This is not the kind of software for which there is a commercial demand, but anyone who does this job would certainly welcome the help that Mr Ketteringham's programs can give to typesetters.

Reading letters like these is a great pleasure and very encouraging. Keep them coming in, readers.

IDEAS WANTED

If you have written a piece of useful software making use of your micro for business or pleasure and would like to share your knowledge and experience, write to Roger Carus, c/o *Acorn User*, Redwood Publishing, 20-26 Brunswick Place, London N1 6DJ. Or use British Telecom Gold: 81:RED001.

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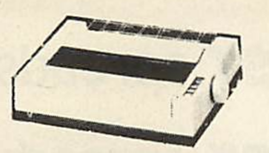
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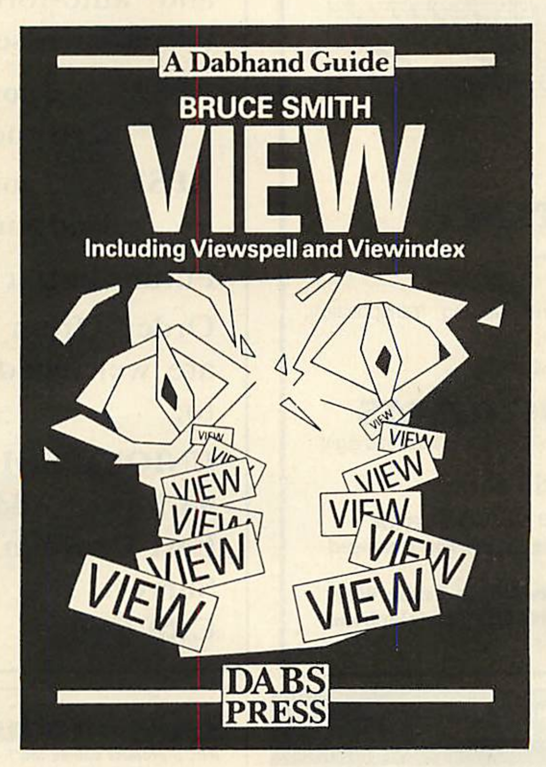


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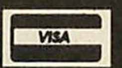
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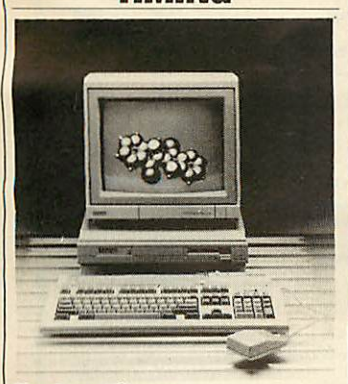
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ODD TIMING



Short on software

Sir, I would like to ask how Acorn can produce such an outstanding machine as the Archimedes while still failing to sort out their marketing. One example is the release of the 400 series. The delay with respect to the 300 series is understandable, but the delay of the 410 relative to the 440 is not. It is difficult to predict which would attract more sales if they were released at the same time but, given that the 410 can be upgraded, it would attract many 440 buyers if available first. Thus the initial sales volume is likely to be less by the current approach. Surely the future of the machine lies in creating a viable software base as soon as possible.

Richard Francis
Holland

There are several reasons for the apparently premature release of the 440. First Acorn have tried to get their 'flagship' out into the public view as soon as possible. Also, the 400 series is aimed at professional users and any 'professional' software would need 4 megabytes (or certainly more than the 1 megabyte available on the 410) on which to be developed. This is often the case with other computer systems, where one-off machines with very large memories are built, purely for the purpose of software development. The internal 'development' machine made by Acorn did in fact have 4 megabytes.

PUSHING FOR PCS

Sir, I heartily endorse the opinion expressed by your correspondent J Alexander in the April issue of *Acorn User*. In my place of employment we use several programs which run on BBC computers. These have been developed by virtue of the fact that the writer could work at home on privately owned equipment, identical to that at the office. Now the workload has increased, the company is buying PCs and that facility is lost, apart from the use of BBC Basic 86 by M-TEC which we have found very satisfactory. To make the most of all the proprietory programs now available, those of us who are interested need the MS-DOS facility. I have tried the 512k second processor with the Master 128, and have found it to be wanting – as, I suspect, I would find the current PC emulator with the Archimedes.

For the enthusiast to remain faithful to the BBC, to be at the forefront of technology and to keep in step with the business world, the Archimedes, in conjunction with the PC podule and suitable 5.25-inch disc drive, must be more than simply 'very good', it has to be excellent. Otherwise it remains a highly desirable and expensive toy that I too, will have reluctantly to sacrifice for an Amstrad PC1640.

A Wigand
Andover

Although Acorn still has no plans to release the PC podule, it has brought out a second version of the PC emulator which runs slightly faster and gives almost double the workspace – 540k – as the original.

COMPACT MUSIC



Not Companionable

Sir, I own a Master Compact and operate with a second 5.25-inch drive. I have recently purchased a Music 5000 synthesiser from Hybrid Technology and intended operating this with a Mertec Compact Companion as the Compact has no 1MHz bus.

I cannot however obtain any sound although the system seems, at least visually, to be operating satisfactorily. The reason for this, I have been told, is that the Mertec equipment uses a 2MHz bus rather than 1MHz. I would be obliged if you could inform me whether any adaptor or other device could help me out of this problem, or direct me to someone who could assist me.

James MacDowall
Glasgow

Chris Jordan of Hybrid Technology replies:

'The Hybrid Music system is not guaranteed to work on a Compact, but if the software is transferred from the 5.25-inch DFS discs supplied, there is no reason why it should not work with a 1MHz bus adapter.'

At present there are no 1MHz bus adapters for the Compact.

SWAPPING DISCS

Sir, A friend of mine has some double density, dual disc drives which are currently working on his BBC B micro. Can they operate on my Electron and if so, which interface do I need to connect them?

T Shields
London

Double density, dual drives will work perfectly well on an Electron provided you have the appropriate interface. Such an interface is available from Advanced Computer Products, 6 Ava House, High Street, Chobham, Surrey GU24 8LZ.

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SEARCHING FOR SCANNERS


Pause on pixels

Sir, While reading a friend's *Computing with the Amstrad* magazine, I noticed a review of a device which attaches to a printer to scan sheets and digitise the pictures, photographs etc. Am I right in assuming that no-one has yet developed a scanner for the BBC? Surely it is not beyond the wit of designers to invent and market something of this type for the BBC micro?

P Spall
Welling

As far as we know, there are no digitisers of the type you describe for the BBC micro. However, there is a possibility that one may appear in the form of a simple hand-held scanner, for the Archimedes.

ITCHING FOR INDICES

Sir, I have kept every copy of *Acorn User* since issue one. It provides an unparalleled history of the development of BBC computers, and a very useful work of reference on operating these machines.

Most of the magazine content is of lasting interest and use, but unfortunately over the past two years, it has become increasingly difficult to find items half-remembered from previous issues.

The reason for this? You have discontinued an essential part of the magazine – the annual index.

D Smith
Northants

An index similar to the above takes a lot of work and so the excuse has to be yet again 'not enough time'. A disc-based bibliography is by far the easiest way of locating 'lost' articles. Such an index is supplied by McHugh Enterprises. The program allows you to step through a database of past contents or search for a specific word. Output can be dumped to a printer at any time to provide a hard copy. McHugh Enterprises can be contacted at 43 Hookstone Oval, Harrogate HG2 8QE.

COMMS QUERIES

Sir, I would welcome an article about modems and communications in general. I would like to move into this field, but there seem to be so many differing standards that it is all rather bewildering. A guide for beginners would be very much appreciated. I have heard that the *Encyclopedia Britannica* is available as an on-line database for modem owners. Is this true? If not, is it likely ever to happen?

Patrick Nethercot
Sunderland

Like most computer related topics, communications can be rather daunting at first, with new terms that are off-putting to the beginner. The subject has been covered in some detail in June 86 and July 87. We are also planning a communications special for July 88. Prestel runs a series of on-line databases, one of which may suit your requirements. They can be contacted on 01-822 1100.



Prestel on-line

ART VERSIONS

Sir, I am writing to you concerning your *Super Art* utilities programs 'Art Comes Undone'. The programs will work only on earlier versions of the package, namely versions 3.41 and 3.51. The menus on version 3.61 are slightly different. Instead of Undo at the top of the options menu, there is a 'Def. patterns' option, and there are only two user options at the bottom. Undo is at the bottom of the Goodies menu.

Is there any way to change the programs so that they will work on my version of *Super Art*?

M Roberts
St Albans

With so many different versions of *Super Art* (we also know of version 3.31), it was inevitable that the 'Art Comes Undone' programs would not always work. A list of program changes for versions other than 3.41 and 3.51 should be appearing in a future issue.

SCRIPTED SOLUTION

Sir, I am writing with reference to the letter 'Not in the Script' in the April '88 issue of *Acorn User*. G2 Systems offer a wordprocessor called *Masterscript* which has been specifically written for producing television and film scripts on any model of BBC micro. It allows independent editing and movement of two columns, soft keys for camera directions and various special printout options which are often needed in television applications.

Masterscript is one of a large range of software and hardware packages produced by G2 Systems for TV and film applications.

Glyn Powell-Evans
G2 Systems

G2 Systems can be contacted at 5 Mead Lane, Farnham, Surrey GU9 7DY.

DOESN'T ADD UP

Sir, Looking through some back issues of *Acorn User*, I came across A Valentine's disc backup utility in Acorn Forum (November '87). The program appeared to be just what I was looking for, but unfortunately there was no checksum. Could you possibly publish the missing checksum?

J McIver
Leeds

We try to include checksums whenever possible but sometimes the odd checksumless program manages to slip through! The following lines should be added to the program:

```
 145 PROCclearmem
 155 PROCchecksum
2380 :
2390 DEF PROCclearmem
2400 FOR I%=&900 TO &B60
2410 ?I%=0
2420 NEXT I%
2430 ENDPROC
2440 :
2450 DEF PROCchecksum
2460 C=0
2470 FOR I%=&900 TO &B60
2480 C=C+?(I%)
2490 NEXT I%
2500 IF C<>59649 THEN PRINT "Check listing.":END
2510 ENDPROC
```

The Account Book

If you have been thinking of computerising your business or have been disillusioned by the complex manuals and screens of codes most accounting programs offer then you are in for a pleasant surprise. You do not need to know anything about accounting to use **The Account Book**, and no matter how small your business, you will be amazed at how easy your book-keeping will become. There are no strange monthly 'rituals' or data sorting (which is completely *automatic), but more* importantly, there is no limit to the number of entries you can make. You can see your bank and cash balances, immediately, at any time together with a break-down of all your entries including profit/loss figures and any discrepancies between your receipts and payments which allows you to balance your books with your bank statements with the minimum of fuss. Your entries can be analysed for reports in over 50 different ways. One example of this is listing unpaid invoices from a particular customer, for an individual month, from a certain month to date or for all months. Another is to find out not only how much your motor expenses were, but also how much of it was for, say, petrol. If you are VAT registered, the **Account Book** will produce your VAT lists and returns for any period, automatically.

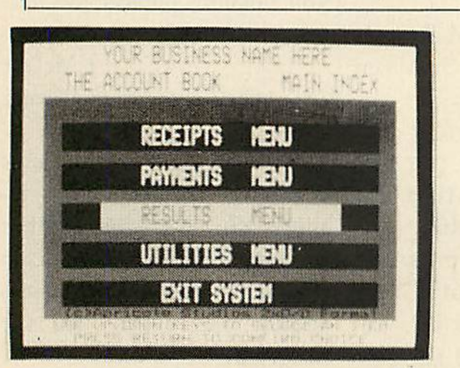
The number of key presses has been optimised for rapid entry of data and by using the labeling facility a single key press will enter all the details of a standing order etc. Help messages are always displayed on screen, but the system is so easy to use, you probably won't need them.

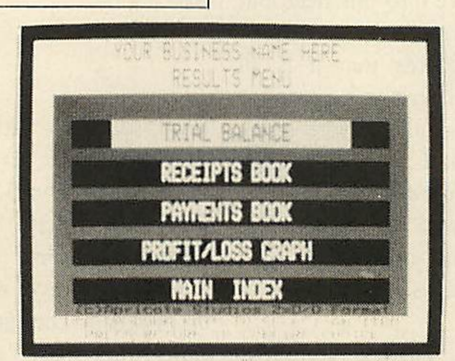
To get you going, a comprehensive and easy to read manual is supplied with the system, and a free telephone help-line service for any technical queries or advice is also provided. **The Account Book** was launched six months ago, and our customers range from self-employed people to retail shops and limited companies. The following are two quotes from the many letters of praise we have received:

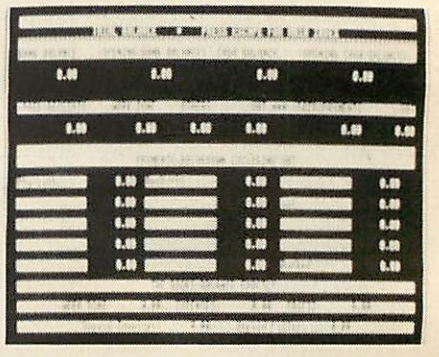
> ***"I have brought my accounts up to date from the beginning of my year, which starts 1st May, without any trouble at all. All nine months are printed out in the neatest possible way.***
>
> ***I have to congratulate you on a very good piece of work. Far, far better than anything I have previously tried for the BBC Master and at a very much lower cost. In fact I have abandoned two rather expensive programs because they are too complicated for the needs of a small business, difficult if not impossible to use, and do not produce print-outs which are helpful. How right you were to design your layout on a normal ledger. It was just what I was looking for. I only wish I had the time and knowledge to write a review of it for the BBC magazines. Someone should."***

> ***"Thank you for the Accounts program which is working well and is, without doubt, the solution to my book keeping problems. . . . . it is incredible value for money and its operation is simplicity itself."***

Many thanks to Mr Ronald Whitehouse of Maldon, Essex and Mr Geoffrey Allcock of Southampton for allowing us to quote from their letters.







The Account Book runs on all models of BBC computer from the BBC B to the Master and requires a minimum of 1 double sided 80 track drive, dot matrix printer and mono or colour monitor. We are at present working on a second module to complement The Account Book which will include invoicing, statements and stock control. There is only one thing left to mention. . . . the price: Just £27.95 inclusive.

Please send me a copy of The Account Book
I enclose Cheque/P.O. for £27.95 made out to APRICOTE STUDIOS.
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...
POST CODE:.................................
TEL:...

AU6.

SOFT SELL

Sir, Looking at the advertisement for the Archimedes in the national press, I wonder whether Acorn is actually trying to sell its new micro? There is no mention whatsoever of its capabilities or why it is so special – it could even be just another IBM PC clone – and an expensive one at that!, I for one, appreciate that the Archimedes is an excellent micro but does the general public? Unless Acorn improves its advertising, it is certain to loss sales.

Having owned a *Model B* and subsequently a Master, I am aware of the sophistication and facilities offered by the Acorn micro. There is nothing in Acorn's current advertising, however, to encourage the general public to find out the potential of the Arc. The standard of advertising falls far short of Acorn's competitors such as Amstrad.

Still on the subject of Archimedes, I was appalled by the letter of J Alexander in *AU* April 88, in which he says that without an MS-DOS podule he cannot even consider an Arc. It seems pointless to buy an Arc, and then degrade it to a PC clone. There are far cheaper ways to run MS-DOS software. Few people would contemplate going shopping in a Grand Prix racing car!

Although MS-DOS is the current standard, it isn't a particularly versatile or sophisticated operating system and as IBM and Microsoft are developing the new OS/2 operating system, it is likely that the standard will soon change.

S Reading
Gravesend

There are arguments both for and against running MS-DOS on the Archimedes. Most people who wish to run PC software do so because they are used to it, or because there is nothing better written specifically for the Arc. Acorn certainly has no intention of turning the Archimedes into another PC clone; its 'Springboard' card has been developed to cater for PC users. The PC emulator (see 'Pushing for PCs') is intended to provide a stop gap until more software becomes available for the Arc.

BUT IS IT ART?



Quest: the fullest feature list

Sir, I own a Master 128 and am very interested in producing graphics. I have been using Clares', 'Artroom' but have found it lacking in some areas: no ellipses for example. I have also noticed that this is the case with other are packages; Timpaint – no square, Artisan – no spray can.

Are there any are packages that you can recommend that have everything?

Ben Byrne
Essex

Watford Electronics' Quest Paint has just about the fullest list of features available on any current art package for the BBC range of micros.

Adding Watfords's Conquest ROM also allows access to the ellipse and arc features of the Master's MOS. Quest itself was reviewed in October 1987's Acorn User, and a review of the Conquest ROM will be appearing in next month's issue. Watford is at Jessa House, 250 Lower High Street, Watford, WD1 2AN, Tel (0923) 37774

PRESS FOR ACTION

Sir, In the preparation of worksheets and workbooks for my pupils, I frequently require a 'newspaper' type format to allow the introduction of diagrams, sketches etc. However, I hae not seen an ADFS-based desktop publishing package that claims compatibility with the Electron. I would be grateful if you could advise on a suitable system. I have seen advertisements for AMS'S Stop Press and so on, but these are non-Electron.

Michael Howe
Basingstoke



AVP plan Electron DTP

Although it is only currently available in DFS format, AVP is planning an ADFS version of its Pixel Perfect software.

The new format will be available for Master Compact and Electron computers on 3.5 inch disc.

This program allows you to import text from View or other wordprocessors, to create multiple columns, and insert graphics in position. There are three standard fonts but extra 'headline' fonts are available to lend style to your layouts.

GOOD NEWS

Sir, I sometimes read complaints from readers about the lack of service from certain advertisers. I thought you might find it a pleasant change to report a work of praise.

I recently managed to persuade my son-in-law to buy a Master Compact. His worst fears were confirmed when it gave trouble after less than a week. In this case though, a visit to the computer's suppliers, Watford Electronics, cleared up the problem in less than half an hour.

In any business, mistakes will occur; what matters is the way they're dealt with. Contrary to the ecperience of some readers with other suppliers, my own requests to Watford Electronics have always been handled with courtesy. I suspect that this may be one of the reasons for that company's growth. I hope you can find space to report one customer's satisfaction.

W Stanton
Worcester

NO RISC

Sir, When I bought my Master eithteen months ago, I was told by the dealer that transputer and RISC add-on boards would be available. Is this true? Could you also recommend a beginner's guide for assembly programming?

Craig Dyke
Solihull

There are no plans for a transputer add-on, although a RISC second processor was built for development work. A used guide is *Assembly Languages Programming on the BBC Micro* by Ian Birnbaum.

USER GROUPS

LONDON

East London. SOBAT Computer Club: Mr. T A Kayani, 12 Calderon Road, London E11 4EU Tel: 01-556 5423
London Association of London Computer Clubs: Robin Bradbeer, Polytechic of North London, Holloway, London N7 8DB
London. *Association* of Computer Clubs: Rupert Steele, 12 Philbeach Gds, London SW5 9DY
London. Radio Amateur Micro User Group: Contact by bulleting board No. 8630198
North London. BBC Micro Users Group: Ric Keyworth, 4b Kilburn High Road, London NW6 5UL. Tel: 01-734 9235
North London. North London BBC Micro Users Group, 82 Hornsey Lane, London N6 5LU. Tel: 01-263 6760 (eves)
Wandsworth. Wandsworth Computer Club: C Kendrick Earlsfield Library, Magdalen Road, London SW16
West London. Personal Computer Club: Chris, Tel: 01-743 1579; Steve, Tel: 01-540 6271; Blue, Tel: 01-579 5415

SOUTH-EAST

Aylesbury. BBC Micro User Group: Aston Clinton County Combined School, Twitchell Lane, Aston Clinton, Aylesbury, Bucks HP22 5JJ Tel: (0296) 630276
Bognor Regis. Bognor Computer Group: E R Piper, 2 Ely Gdns, Aldwick Park, Bognor Regis, Sussex PO21 3RY
Bracknell: Bracknell Primary Schools Computer Users Group: D Donaldson, Wildridings County Junior School, Netherton Bracknell, Berks RG12 4DX
Brighton. Brighton, Hove and District Computer Club: J Smith, 30 Leicester Villas, Hove, East Sussex BN3 5SQ
Bucks. South Bucks Acorn Users Club: D Park, 160 White Hill, Chesham, Bucks HP5 1AZ Tel: Chesham 783097
Camberley. Camberley Computer User Group: D Crosby-Clarke, Tel: Crowthorne 771590, Prestel Mailbox 344771590
Caterham. Computer Club: Caterham Leisure Centre, Godstone Road, Caterham, Surrey CR3 6RE
Dartford. CP/M User Group: Diana Fordred, 72 Mill Road, Hawley, Dartford, Kent Tel: (0322) 22669
Guildford. West Surrey Computer Club: Jan Spencer. 52 Lindfield Gdns, Guildford, Surrey GU1 1TS Tel: (0483) 63512
Harpenden. Harpenden Microcomputer Group: P Cowley, 36 Southdown Road, Harpenden, Herts AL5 1PG
Harrow. Harrow Computer Group: Bazyle Butcher, 16 St Peter's Close, Bushey Heath, Watford WD2 3LG Tel: 01-950 7068
Ilford. ILBUG: Peter Jones, 1 DeVere Gdns, Cranbrook, Ilford Essex IG1 3EB
Iver. Iver Computer Society: John Haigh, 11 Colliston Walk, Ford Farm. Calcot, Reading, Berks RG3 5ZJ Tel: (0734) 417534
North and Mid Essex. NAMEBUG (User Group): Andy Purkiss, 12 Palm Close, Witham, Essex Tel: (0376) 515609. Prestel 376515609
Reading. Reading User Group (RUG): Tel: Richard Rowlands, 28 Anstey Rd, Reading Berkshire, RG1 7JR Tel: Reading 596825 (eves)
South East Essex. BBC User Group (SEEBUG): Mr A P Jordan, 97 Oakhurst Drive, Wickford, Essex SS12 ONW Tel: Rayleigh 771428
Sutton. Sutton Library Computer Group: The Secretary, 21 Village Row, Sutton, Surrey SM2 6JZ Tel: 01-642 3102
Welling. Computer Users Club: Tony Latham, 69 Hadlow Road, Welling, Kent DA16 1AX
JP101 User Group: c/o 8 Cherry Gdns, Billericay, Essex CM12 OHA
St Albans. RISC User (for Arc Users): c/o Dolphin Place, Holywell Hill, St Albans, Herts, Al1 1EX Tel: (0727) 40303

SOUTH & SOUTH-WEST

Fareham. Porchester & Fareham Computer Club: Michael Archer, 113 Deerhurst Crescent, Paulsgrove, Portsmouth, Hampshire PO6 4EJ Tel: (0705) 325647

MIDLANDS & ANGLIA

Birmingham. The Midland Amateur Radio Society BBC User Group: M Nyman, Unit 16,60 Regent Place, Off Caroline St, Birmingham 1 Tel: 021-382 3606
Boston. Boston Acorn Computer Users Group: J C Goodwin, 245 Church Green Road, Fishloft, Boston, Lincs PE21 ORP
Burton-on-Trent. Beeb Users Group (Bug Club): Mrs Linda Yeomans, 13 Regent St, Church Gresley, Burton-on-Trent, Staffs DE11 9PL Tel: (0283) 216445 (eves)
Cambridge. Bottisham Acorn User Group: Gerald Wilcockson, 19 Gallows Hill, Saffron Walden, Essex CB11 4DA Tel: Saffron Walden 23793
Derby. Derby Microcomputer Society: Mrs Beverley Bowman, 6 Shady Grove, Hilton, Derbyshire DE6 5FX
Dudley. Kingswinford BBC Micro Club: Kingswinford Community Centre, High Street, Kingswinford, Dudley, West Midlands
Glossop. Glossop Computer Club (Derbyshire): T S Fox, 4 Park Lane, Little Hayfield, Stockport, Cheshire SK12 5NW Tel: (0663) 44260
Huntingdon. RAF Personal Computer Association: Sgn Ldr J A Upham, Man S (ADP), HQ RAFSC, RAF Brampton, Huntingdon PE18 8QL
Norwich. Amateur Computer Club: Andy Leeder, Church Farm, Stratton St Michael, Norwich NR15 2QB
Norwich. Norwich and District BBC Microcomputer User Group: Roy Street, Church Farmhouse, Temelthorpe, Dareham, Norfolk NR15 2QB Tel: Foulsham 579
Nottingham. Micro Club: John Day, 8 Warkton Close, Chilwell, Notts NG9 5FR Tel: (0602) 225660, Prestel 602225660
Redditch. Redditch Computer Club: Anthony Green, 14 Radway Close, Redditch, Worcs B98 8RZ Tel: (0527) 61434
Stoke. POTBUG BBC User Group: J Forest, 50 Cliff St, Smallthorne, Stoke-on-Trent, Staffs Tel: 818430
Stratford. Stratford Computer Club: E Sheppard, 35 Sidelands Rd, Stratford-on-Avon, Warwickshire CV37 9DT
Suffolk. West Suffolk BBC Micro Users Club: Mike Holland, 14 Plovers Way, Bury St Edmunds, Suffolk AP33 2NJ Tel: (0284) 4853
Suffolk. Gateway Computer Club: Phil Herberer, 164d Radcliffe Road, Lakenheath, Suffolk Tel: Eriswell 2363

NORTH-WEST

Blackburn. Blackburn Acorn User Domain: c/o Yuticks Nest, Pringle St, Blackburn, Lancs Tel: (0254) 55578
Cheshire. Mid-Cheshire Computer Club: Michael Christie, 496 The High St, Winsford, Cheshire
Cumbria. West Cumbria User Group: P Majid Tel: (0946) 62732, or K Purkiss, Tel: (0946) 66586
Liverpool. Mersey BBC User Group: Nik Kelly, 56 Queens Drive, Liverpool L4 6SH
Rochdale. Rochdale's Beeb Owners Group: P Halliwell 81 Mornington Road, Kirkholt, Rochdale, Lancs OL11 20J
St Helens. SNUG (Special Needs User Group): J Hughes, 39 Eccleston Gardens, St Helens WA10 3BJ Tel: (0744) 24608
Wirral. Wirral Micro Users Group: David Walsh, 23 The Pines, Spital Road, Bebington, Wirral L63 9PH

NORTH-EAST

Huddersfield. Huddersfield BBC Micro User Group: S Gill, 21 Mayfair Ave, Sowood, Halifax, West Yorkshire Tel: (0422) 73058
Hull. Forum 80: 421 Endike Lane, Hull HU6 8AG
Hull. MUSE (for teachers): PO Box 43,231/2 Friary Chambers, Whitefriargate, Hull HU1 2HD Tel: (0428) 20268
Leeds. Garforth BBC User Group (Garbug): Mr D G Bell, 84 Park Lane, Rothwell, Leeds LS26 OEY
Keighley. Keighley Computer Club: Colin Price, "Apple Garth", The Hobb Hill, Chapel Road, Steeton, Keighley, West Yorkshire Tel: (0535) 54738
Newcastle. Newcastle & Washington BBC User Group (NEWBUG): Multi Purpose Centre, Oxclose Village, Washington, Tyne & Wear Tel: 091-4166407
Newcastle. BIAC (BBC IBM Amstrad and Compatibles user group): N Kidd, Multi Purpose Centre, Oxclose Village, Washington, Tyne & Wear Tel: 091-4166407
Northumbria. Northumbria Electronics and BBC Micro Users Group (NEBUG): Ian Douglas Chapman, 13 Pont St, Ashington, Northumberland NE63 OHH
Sheffield. Parsons Cross BBC User Group: Andrew Grant, 28 Rokeby Road, Sheffield S5 9FU Tel (0742) 461203
Sheffield. Acorn and BBC User Group (ABUG): Mick Cattell (Sec) 128 Greenhill Avenue, Sheffield S8 7TF Tel: (0742) 745209
South Yorkshire. South Yorkshire Personal Computer Group: Bob Hindle, 139 Penrhyn Road, Sheffield S11 8UP
Wakefield. Wakefield BBC Micro User Group: PO Box 65 Wakefield, West Yorks WF2 6YZ

SCOTLAND

Central Scotland. BBC User Group: D Davidson, 2 Akarit Road, Larbert, Stirlingshire FK5 4BY (Tel (0324) 558692
Central Scotland. Archimedes User Group (ScotArc): D Davidson, 2 Akarit Road, Larbert, Stirlingshire FK5 4BY
Econet User Group (Scotland): c/o Michael Ryan, Balkeerie Cottage, Eassie by Forfar, Angus, Scotland.
Inverclyde. Inverclyde BBC Micro Users Club: Robert Watt, 38 Wellyard Way, Greenock, Renfrewshire PA16 OXG Tel: Gourock 39967

WALES

Cardiff. Cardiff BBC Computer Club: Geoffrey Barker, 2 Whitecliffe Drive, Penarth CF6 2RY Tel: (0222) 701023

N. IRELAND

Belfast. Belfast Computer Club: Andrew White, 19 Greenpark Drive, Markethill, Co. Armagh BT60 1PX

OVERSEAS

Australia. BBC Users Group of Canberra: PO Box E58, Queen Victoria Terrace, ACT 2600
Australia. Beebnet: PO Box 262, Kingswood, South Australia 5062
Australia. Ozbeeb Sydney (meetings North Ryde): PO Box 1030, Parramatta 2150 Tel: 635 4868 (day) or 868 4455 (eve)
Australia. Dapto BBC User Group: PO Box 447, Dapto, NSW 2530
Australia. QACUG: S. Dick, PO Box 343, Bulimba, Queensland, Australia 4171
Canada. Atom Users Group of Canada: John Wood, 812 Cabot Trail, Milton, Ontario L9T 3M8
Canary Islands (Spain). BBC Micro Club Tenerife: PO Box 560,38000 Santa Cruz de Tenerife
Eire. Irish Amateur Computer Club: Austin Vaughan, 35 Monastery Drive, Clondalkin, Dublin 12 Tel: 01-593112 (eves)
Finland. Arjen Raateland, Hopeatie 10a21,00440 Helsinki 44 Tel: 90 5625027
France. Club Informatique Assevent: Claude Laurent, 1 Rue du Marechal Leclerc, Assevent 59600 Tel: 27 652294
Greece. Microclub: C Mantzavinatos, 17 Stournara Str, 106 82 Athens Tel: 013640 675 6

ACORN USER ADVERTISEMENT PAGES – JUNE 1988

FREE ADS

BBC B Penpal wanted with disc drive to swop hints, ideas, etc. Aged 12-14. Louise Turner, 49 Cledan, Treowen, Newtown, Powys SY16 1NB.

MASTER 128, £300. Turbo co-processor, £80. 80186 co-processor, £150. 80T drives, £50 each, plus many extras. Tel: Cambridge (0223) 323971.

ELECTRON owners! Slogger SEDFS. Only £40. Slogger ROM Box Plus with *View*, ADT, 8k SWR. Only £30. Tel: (0934) 833494.

TECHNOMATIC 40/80T plinth-mounted dual disc drive, own PSU. £145. Tel: 01-286 0489.

TORCH Z80DP comprises: Z80 second processor, twin 80T disc drive, MCP ROM plus *Perfect Writer Calc Filer* + manuals. £220. Tel: Preston (0772) 21704.

ELECTRON Turbo 64k, Plus 1, Plus 3, Pascal, Lisp, *View, ViewSheet*, DBase, ADFS/DFS, games, books, mags, £240. 5¼ inch disc. £50. Tel: Ruislip 636193.

ADE Plus for BBC model B, hardly used, cost £55, yours for £35. Tel: David, Cardiff (0222) 752143 eves.

ELECTRON, Plus 1, boxed, data recorder, joysticks, leads, books, magazines, 10 games. £90. Tel: (0227) 368287.

FOR SALE Acorn DNFS 1.2 ROM, £12. Computer Concepts *Disc Doctor*, £18. Tel: (0462) 814745 eves.

TEXAS teletype silent 700 incl. acoustic 300/1200 baud modem, can be used for any dial-up service. 100 per cent reliable (as-new). Tel: (0224) 868788.

PRO 5000 Digital joystick, £50. Solidisk 32k SWR, £10. Acorn Electron, £20. Six Electron games including *Elite*, £10. Tel: (0970) 820023.

ELECTRON and ROM Box Plus, cassette, user port, ROMs, manuals, all under 18 months old, £90 the lot. Tel: Lydd 20812.

MASTER 128, disc drive, Citizen 120D printer, paper, monitor lead, joysticks, manuals, loads of software, immaculate. £650 ono. Tel: Byfleet 48846.

ARCHIMEDES 310, two months old, some software. £600. Tel: Bedford 56139.

EMR Midi interface for BBC B, plus *Performer, Composer* and *Editor* software (80T). £55. Tel: Neil (0273) 725178.

ORIGINAL BBC disc software including *Elite, Trivial Pursuits, Dunjunz* and more. £5 each. Tel: Mike (0742) 690675.

FOR SALE 16k SW RAM module for BBC computer. £12 ono. Tel: Norwich 743645 eves.

BBC B, Acorn DFS, Teletext adapter, 40T 100k, 80T 200k drives, 16k SW RAM, 65C10Z second processor, software. £600 ono or split. Tel: Paul (0283) 65635.

BBC B Watford solderless SW ROM board R + W switches, Watford ZIF, MCP-40 printer/plotter, Cumana touch pad, cheap! Tel: Ralph (0483) 63301.

BBC B Acorn DFS, books and software. £210 ono. Tel: Bradford on Avon (02216) 4868.

WATFORD *Word Aid*, boxed, unused, £15. 5¼ in disc cases, metal Cumana and Pace £5 each. Twelve unused discs. Maxell/Memorex. Tel: 051-722 5799.

BBC keyboard. Only £15. Also BBC B, 40T. dual SD SS + PSU, £350. Tel: Alex 01-504 4680 eves.

MUSIC 500, as new including 15 excellent composition discs, £45 ono. 128k Solidisk SWR, £50 ono. Tel: (0905) 429967 after 7pm.

JUKI 5510 printer, not working due to printhead failure but useful for spares or possible repair. Offers? Tel: (0455) 635587.

ACORN disc drive 5¼ in (40T). £35. Tel: (0272) 774642.

BBC B, £1300 worth of equipment. £600. For details tel: (0287) 33036. Includes disc drive, printer, SW/RAM etc.

ELECTRON Plus, 1 64k Master RAM board, ADFS disc drive, *View, ViewSheet, Starstore*, printer ROM DBase, £250 ono. Tel: Basingstoke (0256) 781439.

BBC B Issue 7, Acorn DFS 1.2, Acorn speech upgrade, £255. Solidisk DFDC with ADFS 2.1, £30. Watford 32k Shadow RAM card. £40. Tel: Cheltenham (0242) 36992.

TEN blank discs DS/DD/80T, includes labels, w/protect tabs, hub rings. Tel: Bratton 830818 before 6 pm only.

ELECTRON, Acorn Plus 3, ROM Box Plus, *View, ViewSheet*, 1770 DFS, expansion ROM, manuals + extras. £250 ono. Tel: (0706) 65370.

ELECTRON 32k, plus data recorder. Both in good condition. Tel: (0272) 774642.

***ACORN** User, Beebug, Micro User*, full sets from issue one. Offers? Tel: Nick, Bookham (0372) 58655.

MASTER 128, IM6 drive, manuals, books, discs, etc, £460 ono. Tatung TP80 printer, £100 ono. *Wordwise*, £10. Deliver 100 km. Tel: Windermere 2758 6-8 pm.

ELECTRON, Plus 3, Plus 1, PMS second processor, HiBasic, *View, ViewSheet, ViewStore, ViewSpell*, discs, manuals, books. £200. Tel: Leatherhead (0372) 372010.

ROM Box Plus, for Electron, hardly used, £30. Also *Electron Users*, £10. Tel: (0509) 213123.

BBC B, good condition, colour monitor, RGB, optional to green, joystick, lots of games. £375 ono. Tel: Nick 01-346 1473.

BBC B Viglen console, twin drives, Watford ROM/RAM board, green monitor, *InterWord, Spell Master*, etc, EPROM programmer, £700. Tel: Southampton 769643 eves, weekends.

BEEBUG *Spellcheck 3* ROM + dictionary disc. £15. Tel: 01-445 3000.

TWO BOOKS: 'Z80, Assembly Language Programming', Leventhal, £7. 'Programming the Z80', Zaks, £7. Exmon ROM, £10. Tel: Langport 250130.

BBC B, Watford 32k S RAM and 128k SW RAM, twin 40/80T drives, Opus DDOS, in Viglen unit, hi-res monitor, software. £450. Tel: (0332) 704710.

ACORN Plus 1, F-Byte joystick interface, *Quickshot Two*, Turbo driver (kit). £70 ono. Tel: 061-442 4046.

SOLIDISK 2MEG128, £25. 3-in drive, £25. ADI, £15. 30 3-in discs, £30. Tel: (0324) 37040.

ROMS: *ViewStore* £30, *ViewSpell* £20, BCPL £15, Dabs Press MOs + fingerprint £10, boxed, manuals, vgc. Tel: Cambridge (0223) 323971.

ACORN Electron Plus 1, Solidisk interface, disc drive, printer, tape deck, joysticks, games. £200 ono. Tel: (0273) 772503.

ATPL SW ROM board for BBC B computer, £15. Brother HR-5 thermal transfer printer with PSU, £25. Tel: 01-204 5035.

FIRST offer gets:- WE DDFS + manual, Advanced user guide, Shinwa CP80-T1 printer, AMX Mouse + *SuperArt* (Master 128 version), *Wordwise*. Tel: (0229) 62566.

EPSON DX 100 daisywheel printer, as new. Cost £420, accept £200 ono. Full width carriage plus 5 spare ribbons. Tel: (0324) 558692.

BBC B OS 1.2 Issue 7, Kenda DNFS, 80T disc drive, handbooks, all as new. £375. Tel: Richard 01-350 2061 eves.

BBC B, Epson FX80, colour monitor, dual disc drive, plus books, software, host of extras, will split, or sell complete. £650. Tel: (0704) 37821.

BBC B Issue 7, 80T disc drive, 1770 DDFS, 16k SW RAM loads of ROMs on disc. £300. Tel: (0493) 780909 eves.

MASTER 128, £300. LX80 printer, £150. Philips g/screen, £55. Pace series 4 modem 2123S, £200 ono. Tel: Braintree (0376) 28201.

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MASTER, switchable DS drive, tracker ball, cursor ROM, cartridge, both manuals, MOS guide, *Elite*, £575. Tel: Bradford (0274) 590021 eves.

ACORN USER, every issue from No. 1 to Dec' 87 - offers? Amber 2400, 24 char/line, dot matrix printer, £15 ono. Tel: (0344) 776674.

REPLAY, plus much original software (recent), also loads of magazines, *AU's* and *MU's*. For prices contact: B Sparrow, 10 Falconers Field, Harpenden, Herts.

BBC B+ 128k, £240. Cumana dual 40T drives, £99. *Mini Office II*, £10. Complete with manuals, covers, £330. Tel: Ian (04023) 47149.

CUMANA 80T dual disc drive, own PSU, £100. Tel: 01-692 3432.

BBC B, Watford DFS, 40/80T DS/DD drive, *InterWord*, AMX Mouse with *SuperArt*, Kaga KX-118B high-res monitor, £365. Tel: Tring (044282) 4600.

BRAND NEW bargains. Printmaster ROM, £15. Termi ROM, £12. Wet-type disc-head cleaner pack, £4.50. Tel: Jeff, Hopwood (0924) 263503.

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WANTED *Spellmaster*. Write to Ravinder Sahota, 15 Springfield Cres., West Bromwich, West Midlands B70 6LL.

WANTED Chalice Software Vector 1 tape to disc utility, also Vector 2 disc to disc utility, Acorn DFS for BBC B. Tel: 01-570 6933.

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Flying Z88s from junkie

Micronitter Ian Burley, identified as a Z88-junkie in last month's Abuser, has decided to junk his Z88. Cuddly 5ft 2in Ian threw it across the Hotel California lobby in exasperation when the batteries ran out, leading to him being christened with the nickname 'Hurley'.

Poor old Hurley had leant on the bag disguising his Z88 and accidently switched the machine on.

That tale reminded our ace reporter Orson of an earlier Sinclair gadget, the Black Watch. Remember them? With the red LED display which was only lit when a button on the thing was pressed?

An old mate of Orson's taped down the button to see the display change from 11.59 to 00.00. Unfortunately, he fell asleep; the batteries ran out; and the watch never lived to tell the time again.



Seconds out

Andrew Fedonczuk's Mandelbrot program from March attracted the attention of *The Guardian* last month. But if they found Andrew's remarkable for its speed, we hope they caught the monthly 3.5in disc for April which carried Stephen Streater's version. This pulled it off in three seconds!

Tricky View

We obviously don't look at back issues enough. Orson caught out everyone in the office by getting them to type in Field 27 in *View* command mode. The result on version 3 is amusing, in earlier machines it's a pain (try pressing Escape). But to amuse *View* 2.1 users, try typing in Daytona or wheelchair (subtle one, that).

Down in the jargon jungle

'Couch potato' is one of the hottest Loose Ends to come out of Ned Sherrin's mouth on Radio 4, and now it's even the name of *NME*'s TV preview column. But remember where you read it first — Abuser back in July '86.

Now comes the latest catch phrase from the Orson word factory: 'clappydoos'.

The Gorbals-bred or fish farmers among you might recognise it, but we leave the incognoscenti to think up their own meanings (we'll find a fiver for any good ones that we are able to print).



A case of hidden identity

Crown Computer Products of Burscough in Lancashire has latched on to a big market with this carry case for Amstrad PCWs — people who don't want to be seen carrying them! (Fashion-unconscious Obergruppenfuhrer Quinn carts Masters around in a Sam Fisher bag from Covent Garden.)

Gone west

Two departures this month from the mag. Ad man Gary Lucas just beat supersub Stuart Anderton out the door to go off to shine his light on the menaces at Dennis Publishing for *Computer Shopper*, where he'll no doubt bump into *AU* old favourite Bruce Smith freelancing on *DTP*.

Stuart has headed west to double the population in Wiltshire and set alight the subs' desk at the *Wiltshire Times*.

Tripping down memory lane

What's the best article ever in *AU*? We asked people to nominate three in May's Reader Survey (you've still got till May 27 to reply and try to win an Arc), and so Orson went around the office to discover the Golden Oldies. One revered by everyone is Maths in Motion by Michael St Aubyn from November 1985. MiM plots Lissajous figures and changes their shape using the cursor keys. It's free on this month's disc and cassette.

Mandelbrots are Rob Miller favourite. Arc owners have got it made, but BBC owners don't have to be left out if they've got May 1986.

This was followed up by more fractal patterns from David Johnson-Davies using Newton's equations in the July issue. Tony Quinn goes back to October 1983 and Susan Stepney's article on fractal patterns for a milestone in computer magazines.

For Graham Bell, Tony Rudkin's *View* printer driver from March 1984 was the inspiration for a trail that led to him writing for *AU*, working for it, becoming Editor and writing a book on the *View* range.

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